Volume Title: The Distributional Aspects of Social Security and Social Security Reform

Volume Author/Editor: Martin Feldstein and Jeffrey B. Liebman, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-24106-8

Volume URL: http://www.nber.org/books/feld02-1

Conference Date: October 21-23, 1999

Publication Date: January 2002

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URL: http://www.nber.org/chapters/c9747

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Redistribution in the Current U.S. Social Security System

Jeffrey B. Liebman

Social Security is the largest income-transfer program in the United States. In 2001 the program is expected to bring in $532 billion in (noninterest) revenue, mostly from payroll taxation of current workers, and to pay out $439 billion, mostly in benefit checks to retirees.[1] Because its benefit formula replaces a greater fraction of the lifetime earnings of lower earners than of higher earners, Social Security is generally thought to be progressive, providing a better deal to low earners in a cohort than to high earners in the same cohort. In addition, the program is considered to be particularly important in preventing poverty among the lowest-income elderly.[2]

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The author is grateful to Jeffrey R. Brown, Don Fullerton, Stephen C. Goss, David Pattison, Andrew A. Samwick, and Stephen Zeldes for discussions about this research; to Joshua Pollet, Peter Spiegler, Elisabeth Welty, and Ying Qian for excellent research assistance; to Henry Aaron, Gary Burtless, Peter Diamond, Martin Feldstein, and conference participants for comments on an earlier draft; and to Hugh Richards for providing tabulations from the National Longitudinal Mortality Survey. This research was conducted while the author was also a Bureau of the Census research associate at the Boston Research Data Center; research results and conclusions expressed are those of the author and do not necessarily indicate concurrence by the Bureau of the Census. This paper has been screened by a Bureau of the Census employee to insure that no confidential data are revealed. This research was funded by a grant from the Russell Sage Foundation and by a First Award from the National Institute on Aging.

1. These numbers are for the entire Old-Age, Survivors, and Disability Insurance program (OASDI). The nondisability portion of the program (OASI) that is the focus of this paper is projected to have (noninterest) income of $455 billion and expenditures of $378 billion.

2. Social Security Administration (2000) calculates (ignoring behavioral effects) that without Social Security elderly poverty would rise from 9 percent to 48 percent. Burtless (1994) argues that social insurance programs such as Social Security are more important than means-tested transfers in lifting families out of poverty.

A number of proposed Social Security reforms would increase the link between a worker's Social Security contributions and retirement income, replacing or supplementing the current system with a system of defined contribution personal retirement accounts funded proportionally to earnings.[3] These proposals have led to concern that the amount of redistribution and poverty alleviation accomplished through Social Security would decline if a system based on individual accounts were established.

However, much of the intracohort redistribution in the U.S. Social Security system is related to factors other than income. Social Security transfers income from individuals with low life expectancies to those with high life expectancies, from single workers and from married couples with substantial earnings by the secondary earner to married one-earner couples, and from individuals who have worked for more than thirty-five years to those who have concentrated their earnings in thirty-five or fewer years. Since high-income households tend to have higher life expectancies and receive larger spouse benefits, some of the progressivity of the basic benefit formula is offset. Understanding the redistribution that occurs through the current U.S. Social Security system is important for assessing the potential costs of moving to a mixed Social Security system that incorporates both pay-as-you-go and individual-account components, and for designing modifications to the traditional system that could complement other reforms.

The main results in this paper come from a microsimulation model of the retirement portion of Social Security and use a data set that matches the 1990 and 1991 Surveys of Income and Program Participation (SIPP) to Social Security administrative earnings and benefit records. The model simulates the distribution of internal rates of return, net transfers, and lifetime net tax rates that would have been received from Social Security by members of the 1925 to 1929 birth cohorts if they had lived under current Social Security rules for their entire lives, and finds that Social Security provides within-cohort transfers of 13 percent of Social Security benefits when discounted at the overall cohort rate of return of 1.29 percent.[4] However, much of the redistribution that occurs through Social Security is not related to income, and thus income-related transfers are only 5 to 9 percent of Social Security benefits paid (or $19 to 34 billion), at

3. There is no reason why the individual accounts must be funded proportionally to earnings. Feldstein and Liebman (this volume) show that by funding personal retirement accounts with a combination of flat per-worker contributions and proportional contributions, an investment-based defined contribution system can accomplish as much redistribution as the current system, or more.

4. More specifically, within-cohort transfers are measured as the present discounted value of Social Security benefits received minus taxes paid, all discounted at the cohort rate of return. Therefore, someone whose rate of return is greater than the cohort rate of return receives a positive transfer, and someone whose rate of return is lower than the cohort return receives a negative transfer. Total transfers can be calculated by summing either the positive or negative transfers (which each sum to the same quantity).

2001 aggregate benefit levels.[5] At higher discount rates, Social Security appears more redistributive by some measures and less redistributive by others.

The paper begins in section 1.1 by presenting basic data on the *annual* redistribution that occurs through Social Security, then reviews, in section 1.2, the reasons for preferring a *lifetime* measure of redistribution and the sources of lifetime redistribution in the U.S. Social Security system. Section 1.3 discusses the simulation model, and section 1.4 explains the methodology used for measuring lifetime redistribution. Section 1.5 provides the results on redistribution in the current system, and section 1.6 compares my results to those in recent studies by Caldwell et al. (1999), Coronado, Fullerton, and Glass (2000), and Gustman and Steinmeier (2001), and discusses implications of the results for Social Security reform. Section 1.7 concludes.

1.1 Annual Redistribution from Social Security

Each year, Social Security raises tax revenue from workers and pays out benefits to retirees and other beneficiaries. Table 1.1 presents estimates from the 1998 Current Population Survey (CPS) for calendar year 1998 that describe these annual flows of taxes and benefits for different demographic groups.[6]

The first row of the table shows that in 1998, overall, Social Security paid out $375 billion in benefit payments and raised $430 billion in payroll taxes. The ratio of benefits to taxes was therefore 0.87. Dividing the −$55 billion difference between benefits and taxes by the entire U.S. population of 272 million produces a per capita difference of −$203.

As would be expected, the gap between benefits received and taxes paid differs substantially across demographic groups. Individuals who are under the age of eighteen receive twice as much in benefits as they pay in taxes, because few children have labor income, whereas some receive benefits if their parents are disabled or deceased. In contrast, individuals in the prime working years of thirty to forty-nine years of age receive benefits that are only 8 percent of the taxes they pay. Individuals aged sixty-five and above receive thirty times as much in benefits as they pay in taxes.

Forty-six percent of Social Security benefits go to people in families whose non–Social Security income is below the poverty line. This result is

5. As will be explained in detail later, income-related transfers are calculated by assigning each individual a transfer that is the average for the individual's level of income.

6. The CPS measures total OASDI benefits and does not distinguish between retirement and disability benefits. I assume that the full incidence of the OASDI payroll tax is on the worker and estimate OASDI payroll taxes as 12.4 percent of earnings for individuals with a positive value in the CPS FICA variable (individuals with positive earnings and a zero value in the FICA variable are in sectors of the economy not covered by Social Security). I multiply each individual's Social Security benefit by 1.17 and tax payments by 0.984 so that aggregate OASDI benefits and taxes match the levels reported for calendar year 1998 in Board of Trustees of the Federal Old-Age, Survivors, and Disability Insurance Trust Funds (2001).

Table 1.1 Annual Redistribution from the U.S. Social Security System for 1998

	OASDI Benefits ($ billions)	OASDI Payroll Taxes ($ billions)	Ratio of Benefits to Taxes	Per Capita Difference ($)
All	375	430	0.87	−203
Age				
Under 18	3	1	2.00	18
18–29	4	74	0.05	−1,575
30–49	19	248	0.08	−2,736
50–64	49	97	0.50	−1,231
65+	301	10	29.63	8,981
Family income excluding Social Security benefits relative to poverty threshold				
Less than 50%	125	1	89.64	3,930
50–100%	48	6	7.49	1,837
100–200%	71	31	2.28	882
200–300%	43	52	0.82	−218
More than 300%	88	339	0.26	−1,933
Sex				
Male	184	272	0.68	−660
Female	191	158	1.20	233
Region				
Northeast	77	87	0.89	−187
Midwest	90	105	0.86	−233
South	137	140	0.98	−30
West	70	98	0.71	−451
Race				
White	334	372	0.90	−168
Black	33	38	0.87	−147
Asian and other	8	20	0.38	−935
Hispanic status				
Non-Hispanic	357	397	0.90	−166
Hispanic	18	33	0.53	−487
Education				
Less than high school	108	30	3.57	1,616
High school	134	119	1.13	172
More than high school	132	281	0.47	−1,093

Sources: Author's calculations from the March 1999 Current Population Survey. OASDI benefits and taxes are scaled to match aggregate levels for 1998 as reported in Board of Trustees (2001). OASDI taxes include both employer and employee share. For children under 18, the family head's education level is used for the tabulation by education.

not surprising, because Social Security represents 90 percent or more of income for 30 percent of elderly families and 50 percent or more for 63 percent of elderly families (Social Security Administration 2000). Total Social Security benefits for females are slightly greater than those for males, because the greater longevity for women outweighs their lower average benefit levels. Due to their higher average level of earnings, men pay

substantially more in Social Security taxes than do women. Thus, annual Social Security benefits for men are only 68 percent of taxes paid, whereas benefits for women are 120 percent of taxes paid.

The ratio of benefits to taxes paid is highest in the South, with its disproportionate share of retirees, and lowest in the West, with its large share of younger workers (including recent immigrants). Similarly, although whites and blacks each receive benefits that are roughly 90 percent of taxes paid, demographic groups such as Asians and Hispanics (which include many recent immigrants and relatively few elderly) pay out two to three times as much in taxes as they receive in benefits each year. Finally, individuals in low-education groups receive on average substantially more in Social Security benefits than they pay in taxes, whereas the reverse is true for individuals in high-education groups. This primarily reflects the increase in education levels over time in the United States (i.e., elderly Social Security beneficiaries come from cohorts with lower average education levels than do current workers).

1.2 Sources of Intracohort Lifetime Redistribution in the United States

The results on annual redistribution are interesting because they describe large annual transfers of resources among different demographic groups—transfers that depend mostly on the ratio of beneficiaries to earners within each group. Over a lifetime, however, most individuals transition from earning income and paying Old-Age, Survivors, and Disability Insurance (OASDI) taxes to receiving Social Security benefits. Therefore, taking a lifetime perspective provides a better measure of how the U.S. Social Security system treats different types of individuals.

How a person fares under the Social Security system depends both on how well he or she is treated relative to other people in his or her birth cohort, and on how well the birth cohort is treated as a whole. Although this paper focuses on intracohort redistribution, it is important to note that there are interactions between intercohort and intracohort redistribution. In particular, the early cohorts of Social Security beneficiaries received windfalls because they were the initial generations in a pay-as-you-go (PAYGO) system, and received substantial benefits even though they had paid relatively little in taxes. Because Social Security benefits rise with income, the largest dollar windfalls went to upper-income beneficiaries in these early cohorts. As later cohorts with lower rates of return have retired, the system has become more progressive because the increased payroll tax rates have resulted in higher-income individuals' paying substantially more taxes in present-value terms than they receive in benefits.[7]

7. Burkhauser and Warlick (1981), Hurd and Shoven (1985), Duggan, Gillingham, and Greenlees (1993), and Steuerle and Bakija (1994) show that the higher rates of return earned by early cohorts of Social Security beneficiaries led to net transfers for the system that were often greater for high-income individuals.

The fundamental source of intracohort redistribution from Social Security is its progressive benefit formula. Although OASDI payroll taxes are proportional to earnings up to a cap that is currently $80,400, the benefit formula replaces a higher fraction of lifetime earnings for low earners than high earners. Benefits are calculated by indexing earnings to average wage growth (through the year the worker turns sixty), summing the highest thirty-five years of earnings, and then dividing by 420 (35×12) to produce a worker's Average Indexed Monthly Earnings (AIME). The worker's Primary Insurance Amount (PIA)—the monthly benefit the worker will receive if he or she retires at the full-benefit age—is currently calculated as 90 percent of the first $561 of AIME, plus 32 percent of AIME between $561 and $3,381, and 15 percent of any AIME above $3,381.

This basic relationship between AIME and benefit levels is altered by two major factors. First, higher-income individuals tend to live longer (Kitagawa and Hauser 1973; Rogot, Sorlie, and Johnson 1992; Pappas et al. 1993) and therefore receive benefits for more years.[8] Second, the aged spouse of a retired worker is entitled to a spouse benefit equal to 50 percent of the worker's benefit while the worker is alive, and to a survivor benefit equal to the worker's full benefit after the worker dies. These benefits for spouses and survivors imply that Social Security redistributes from single workers to married couples and from men to women. As will be shown later, by some measures they also offset some of the progressivity of the retired worker benefit because spouses of high earners receive higher spouse benefits than spouses of low earners.[9]

Additional redistribution occurs to individuals with short spells in covered work, such as immigrants and government workers, whose AIMEs can substantially understate lifetime income.[10] In contrast, workers with substantial earnings in years outside their thirty-five highest years are not rewarded by Social Security for that work. Finally, to the extent that the rate of wage growth used to index earnings differs from the benchmark interest rate used to calculate redistribution, the timing of earnings throughout

8. Aaron (1977), Steuerle and Bakija (1994), and Garrett (1995) present illustrative calculations for hypothetical workers that suggest that this effect can be large. Panis and Lillard (1996) show using microdata that income transfers from whites to blacks and high-income to low-income workers are much smaller once differential mortality is considered. In contrast, Duggan, Gillingham, and Greenlees (1995) analyze mortality patterns in the Continuous Work History Survey and conclude that differential mortality does little to offset the progressivity of Social Security. For comparable research on Medicare, see McClellan and Skinner (1997).

9. Boskin, Kotlikoff, Puffert, and Shoven (1987) present results showing how marital status affects the rates of return from Social Security.

10. See Gustman and Steinmeier (2000) for a discussion of Social Security's treatment of immigrants. In theory, the government pension offset and windfall elimination provisions reduce the extent to which workers in noncovered employment receive windfalls from Social Security. In practice, it is often difficult for the Social Security Administration to apply these provisions, because workers do not always report their government pension income to the Social Security Administration.

the lifetime can affect the amount of redistribution a worker receives from the system.[11]

1.3 Data

This paper uses a microsimulation model based on a match of individuals in the 1990 and 1991 panels of the SIPP to Social Security administrative earnings and benefit records for those same individuals. I select SIPP sample members who were born between 1925 and 1929, and construct lifetime earnings and marital histories from age twenty-one through age sixty-four using the administrative records and the SIPP topical module on marriage. I then simulate the sample members' Social Security payroll taxes and benefit levels under current Social Security rules (rather than under the ones they actually experienced).

The strength of the simulation model is that it reflects the full range of experience of a historical cohort. Because the data contain forty-three years of actual covered earnings for each sample member as well as complete marital histories, the results give a comprehensive view of the outcomes that would have occurred for this cohort if it had experienced these alternative Social Security rules.[12] Compared with other microsimulation models used to study the distributional effects of Social Security, this historical cohort model relies little on projected or imputed data. Because I am particularly concerned with the lower tail of the benefit distribution, my ability to observe extreme cases and to reflect the complicated cross-correlations among marital status, earnings, retirement, and mortality is important.[13]

The simulation model requires two types of imputations. First, I construct earning histories for spouses who were absent at the time of the 1990–91 SIPP (due to death or divorce). Second, I impute earnings for individuals located at the taxable maximum for years in which the taxable maximum was at a lower level relative to average wages than it is currently. Further details of the matching and imputation methods are described in the data appendix that appears at the end of Feldstein and Liebman (chap. 7 in this volume).

Once complete earnings and marital histories have been constructed, it is possible to calculate Social Security benefit streams for each individual

11. Social Security benefits are partially taxable for some upper-income taxpayers. I interpret this feature as part of the personal income tax system rather than the Social Security system and do not study it here.

12. The model ignores behavioral responses to these alternative Social Security rules.

13. The drawback of analyzing a historical cohort is that future cohorts will differ along key dimensions from the 1925–1929 cohort. In particular, women will have much greater earnings, and a larger share of individuals in later cohorts will be divorced or never married. In section 1.6, I discuss the likely impact of these factors on the distributional impact of Social Security.

at ages 60 through 100. I assume that sample members claim benefits at their actual retirement ages (obtained from the Social Security benefit records), and then calculate Social Security benefits at each age from 60 through 100.[14] For married and divorced sample members, the model calculates separate benefit streams corresponding to the benefits the sample member would receive if his or her spouse were still alive and if the spouse were dead (assuming that the sample member is still alive). Expected lifetime benefits can then be calculated by weighting each potential benefit-year by the probability that the sample member is alive in that year. For married and divorced individuals, the weights on each of the two benefit streams account additionally for the probability that the spouse is alive. To account for socioeconomic differences in mortality, I use for each race-by-sex-by-education group separate mortality tables that were constructed using a nonlinear least squares regression to fit a standard actuarial function (the Gompertz-Makeham formula) to nonparametric, age-specific mortality rates from the National Longitudinal Mortality Study.[15]

1.4 Methodology for Measuring Redistribution

This paper focuses on the redistribution in the *retirement* portion of Social Security. Contributions and benefits related to disability and pre-retirement survivors are not studied.[16] Including these benefits would increase the measured amount of redistribution to lower socioeconomic groups; however, many Social Security reform plans would preserve disability benefits at current-law levels.[17] Therefore, it is the redistribution in the retirement portion of Social Security that would most likely be affected by Social Security reform.

14. Benefits vary by age because they can depend on whether the sample member's spouse has started receiving benefits and on whether the spouse is still alive.

15. These mortality estimates were developed in joint work with Jeffrey Brown and Joshua Pollet (see Brown, Liebman, and Pollet in the appendix to this volume), and are the same as those used in Brown and in Feldstein and Liebman (chapters 10 and 7, respectively, in this volume). We thank Hugh Richards for providing us with tabulations from the NLMS. We produced separate mortality tables by Hispanic status as well. However, because the data were much thinner and because the demography literature suggests that there is considerable heterogeneity in life expectancies across Hispanic groups, I decided not to differentiate by ethnicity in this paper. For evidence on Hispanic mortality, see Sorlie et al. (1993) and Hummer et al. (1999).

16. Individuals receiving disability benefits according to the data from the Social Security Master Beneficiary Record are excluded from the sample. Thus, OASI benefits paid to formerly disabled beneficiaries after the age-sixty-five conversion of disability benefits to retirement benefits are not modeled.

17. Elmendorf, Liebman, and Wilcox (2001) report that the individual account–based Social Security reform plans studied by the Clinton administration would have shielded Disability Insurance (DI) benefits from cuts. The NCRP plan is a notable exception that applied benefit cuts to disability benefits.

In a social insurance program such as Social Security, the insurance and redistribution functions are closely related. Viewed from a point in time before an individual knows his or her socioeconomic status (and therefore the distribution from which his or her lifetime earnings, marriage, and mortality experience will be drawn), all of the features of Social Security that result in some workers' receiving higher returns on their contributions than others can be interpreted as insurance—insurance against living too long, against having low wages, and against marrying a nonworking spouse. From behind this veil of ignorance, all workers have the same ex ante expected return from Social Security, and different outcomes that occur ex post are simply the payoffs from the social insurance; there is no redistribution. Alternatively, one could view the program from the standpoint of a worker who has just entered the workforce for the first time, say, at age twenty-five. Based on education level, sex, and family background, this worker has an expected distribution of future earnings, marriage, and mortality experience. One could interpret differences in expected net benefits from Social Security across groups defined by characteristics predetermined by age twenty-five (such as race, education, and sex) as redistribution, and within-group variation as ex post payoffs from the insurance.[18]

In this paper, I take a third approach and interpret Social Security as providing insurance solely against longevity risk, and attribute other differences in payoffs from Social Security to redistribution. In particular, differences in payoffs to Social Security due to different lifetime earnings and marriage patterns are considered to be redistribution. Differences due to *expected* mortality (from age twenty-one on), defined within sex-by-race-by-education groups, are also interpreted as redistribution.[19] Differences in payoffs due to differences in the ex post mortality experienced by individuals within the sex-by-race-by-education groups are not considered redistribution and are integrated out by averaging over the possible dates of death with appropriate probability weights.

To implement this concept, I use three measures of redistribution. The first is the internal rate of return, r, that equalizes the present discounted value of Social Security contributions and benefits:

$$0 = \sum_{\text{age}=21}^{\text{age}=100} \frac{S_{\text{age}}(B_{\text{age}} - T_{\text{age}})}{(1 + r)^{\text{age}-21}},$$

18. Some of the results in Feldstein and Liebman (this volume) can be interpreted in this way. A complete accounting of the benefits expected from Social Security at age twenty-five would also incorporate the disability and young survivors' benefits that are omitted from my analysis.

19. This portion of the redistribution through Social Security is common to any system that requires everyone to annuitize at a single price. Brown (this volume) discusses the redistribution that would occur in an individual account–based system that required everyone to annuitize at a single price.

where B represents Social Security benefits, T represents Social Security taxes, and S represents the probability of surviving to a given age.

The second is the net transfer received from Social Security, a dollar measure of the difference between an individual's lifetime benefits and lifetime taxes:

$$\text{NetTransfer} = \sum_{\text{age}=21}^{\text{age}=100} \frac{S_{\text{age}}(B_{\text{age}} - T_{\text{age}})}{(1 + r_d)^{\text{age}-65}} .$$

Specifically, the net transfer is the present discounted value of the individual's lifetime Social Security benefits minus the present value of the individual's lifetime taxes, discounted at a rate r_d and measured as of age sixty-five. In order to focus on within-cohort redistribution, the main results in this paper discount at the cohort rate of return, which for this cohort under the assumptions described below turns out to be 1.29 percent. Therefore, an individual who receives exactly the cohort rate of return on his or her Social Security taxes will have a net transfer of zero, whereas someone with a rate of return higher than that of the cohort will receive a positive transfer, and someone with a lower rate of return will receive a negative transfer. I also show results for real discount rates of 3 and 5 percent.

The third measure of redistribution is the lifetime net tax rate from Social Security. This is simply the net transfer divided by the present discounted value of lifetime earnings.

Three details about the contribution and benefit streams affect the results. First, because only individuals who survive to the age at which they are interviewed in the SIPP are in the sample, I scale up the Social Security contributions of sample members to reflect the probability that a person in his or her sex-by-race-by-education group would not live to each age. Therefore, group averages on rates of return or transfers can be interpreted as the expected return for all individuals in that group who were alive as of age twenty-one (to facilitate comparisons with previous studies, all of the present discounted values that I present are accumulated forward to age sixty-five).

Second, in order that the results reflect the U.S. Social Security system in a steady state rather than one in which the rates of return earned by different cohorts are changing, and that the results be comparable to studies that focus on Social Security reforms that would be implemented over the coming century, I calibrate the life expectancies and payroll tax rates to reflect conditions in 2075 (the endpoint of the Social Security actuaries' seventy-five-year horizon). In particular, I scale my estimated sex-by-race-by-education mortality tables to be consistent with the Social Security Administration's projections for individuals born in 1990, and I assume a payroll tax rate of 15.4 percent, which is roughly the payroll tax rate that would be necessary to support the portion of OASI benefits modeled in

this paper.[20] Under these assumptions, the overall internal rate of return from Social Security for my simulation cohort is 1.29 percent.[21]

Third, because my unit of observation is the individual, I must allocate the payroll taxes and Social Security benefits of married couples across the two spouses. In years during which a married couple is married, I split the total payroll tax paid by the two spouses equally. Similarly, during retirement years in which both spouses are alive, the total Social Security benefits received by the couple are split equally into the benefit streams of each spouse. However, during years before the couple was married, the entire contribution of each spouse stays in the contribution stream of the spouse making the contribution, and Social Security benefits received after one spouse is dead are credited only to the surviving spouse. This approach implies that (except for differential earnings before marriage) the entire difference in rates of return and transfers between two spouses comes from the longer life expectancy of the wife.[22]

One last methodological issue needs attention. In examining the relationship between redistribution from Social Security and lifetime income, the particular definition of income used to classify individuals can have a large impact on the results. I use two different lifetime income measures based on earnings histories. The first is the AIME of the higher earner in the household. The AIME is the measure of income used by the Social Security benefit formula and is calculated by summing the highest thirty-five years of earnings (wage-indexed and including zeros, if any) for the worker and dividing by 420 (35×12). I use only the higher earner's AIME

20. Of the total 19.9 percent of payroll in OASDI costs that are forecast for 2075 (Board of Trustees 1999), 2.59 percent are for DI benefits, roughly 0.28 percent are for young survivors (including children), and roughly 1.6 percent are OASI benefits at ages sixty-five and above for people who converted from DI benefits when they reached the full-benefit age. The DI estimate comes directly from Board of Trustees (1999). The other two estimates rely on Table II.H2 in the 1999 trustees' report, which provides estimates of the number of beneficiaries of each type in future years and weights these estimates by the average benefit levels for each type of beneficiary in 1997 from the Annual Statistical Supplement to the *Social Security Bulletin.*

21. This is similar to the long-run growth rate of the tax base of 1.1 percent that is assumed by the actuaries. One reason my estimate is larger is that my sample contains many more one-earner couples than the population retiring in 2075 will likely contain.

22. The approach I take in this paper is appealing because it shows women receiving a higher rate of return from Social Security than men, as their longer life expectancy would imply. Two other plausible approaches are less satisfactory. One would be to credit each spouse with only his or her own tax contributions and Social Security benefit. This would result in much higher measured rates of return for women (infinite in the case of nonworking spouses) and low rates of return for men, because it would give them no credit for the spouse benefits produced by their earnings history. This would be unsatisfactory because the men in married couples are clearly benefiting from their spouses' receiving enhanced benefits. Another approach would be to credit men with the entire benefit produced by their earnings histories, including the spouse benefit. This approach is unsatisfactory because it would calculate the rates of return for many wives as zero even though they are getting a "very good deal" from Social Security.

for two reasons: First, the AIME of the higher earner is likely to be a good measure of a household's socioeconomic class and will not be confounded by the large variation in the earnings levels of secondary earners. Indeed, because most higher earners work full-time for at least thirty-five years, this measure is similar to the potential earnings measures used in the studies by Coronado, Fullerton, and Glass (2000) and Gustman and Steinmeier (2001). Second, for most couples, the Social Security benefit they receive depends only on the AIME of the highest earner, providing no marginal benefit for work by the lower-earning spouse.[23] Thus, the AIME is the income measure around which the explicit redistribution in the Social Security system is based.

The second measure I use is the total covered earnings of both members of the couple (accumulated to age sixty-five at the relevant discount rate). The appeal of this second measure is that it allows for comparison with the many studies that analyze the impact of government programs on the income distribution using actual rather than potential income data, and it also corresponds to the Social Security tax base. This second measure of income may not, however, be satisfactory for welfare analysis, because a nontrivial portion of the variation in this measure is due to the labor-leisure (or market production versus home production) choice of the secondary earner and not simply to the earnings potential of the household.

1.5 Redistribution in the Current System

1.5.1 Overall Redistribution

The theoretical progressivity of the Social Security system can be seen in figure 1.1, which abstracts from all of the nonincome sources of redistribution by graphing the relationship between AIME and net transfers from Social Security for a hypothetical set of single adults with different earnings levels but identical timing of earnings throughout their lifetimes and identical life expectancies.[24] For comparison with the results to come, the transfers are calculated discounting at a 1.29 percent rate, which matches the aggregate internal rate of return on Social Security for the microsimulation sample, and the mortality table used is the average of those for white males and white females. Initially, transfers rise with income, as the Social Security benefit formula replaces 90 percent of the first $505 dollars of monthly earnings, reaching a maximum net present value of roughly

23. The Social Security Administration reports that 63 percent of women beneficiaries currently receive no marginal benefit from their own earnings and that this percentage is expected to fall to 40 percent in 2060 (National Economic Council 1998).

24. In a steady-state Social Security system in which the rate of return on Social Security is equal to the rate of wage growth, the timing of earnings would not matter.

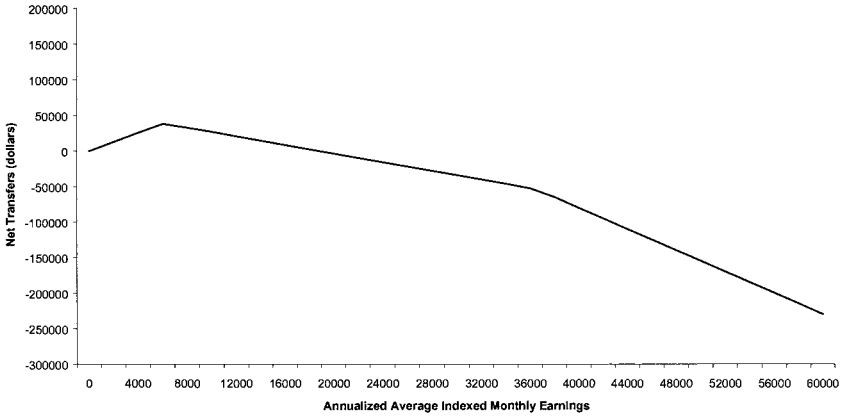

Fig. 1.1 Net transfers from Social Security for hypothetical single adults
Source: All figures are derived from author's calculations from a match of the 1990 and 1991 panels of the Survey of Income and Program Participation to Social Security administrative records.

$38,000 at an annualized AIME of $6,060.[25] Then they fall with income, first at a relatively gradual rate during the range over which the benefit formula replaces 32 percent of earnings, and then at a more rapid rate after the second bend point. Transfers are mostly negative in this figure because the single adults are not benefiting from spouse benefits. For an individual with an annualized AIME of $50,000, the net transfer is −$150,000.

Figure 1.2 shows the actual distribution of net transfers from Social Security with a discount rate of 1.29. In contrast to the striking theoretical relationship between income and net transfers from Social Security in the previous figure, figure 1.2 reveals that transfers can differ widely at a given level of household head AIME. Moreover, a substantial number of high-income individuals receive greater transfers than the typical low-income individual does. For example, 19 percent of individuals in the top AIME quintile receive transfers that are greater than the average transfer for people in the lowest AIME quintile, and 23 percent of top quintile individuals receive transfers that are greater than the average transfer received by people in the second lowest quintile.

Some of the variation in transfers at a given level of AIME can be attributed to the difference between the transfers received by men and women

25. The portion in which transfers rise with income can be thought of as similar to the phase-in region of the earned income tax credit in that it limits the amount of transfers to people with very small earnings who are likely to be unusual cases rather than full-time working poor.

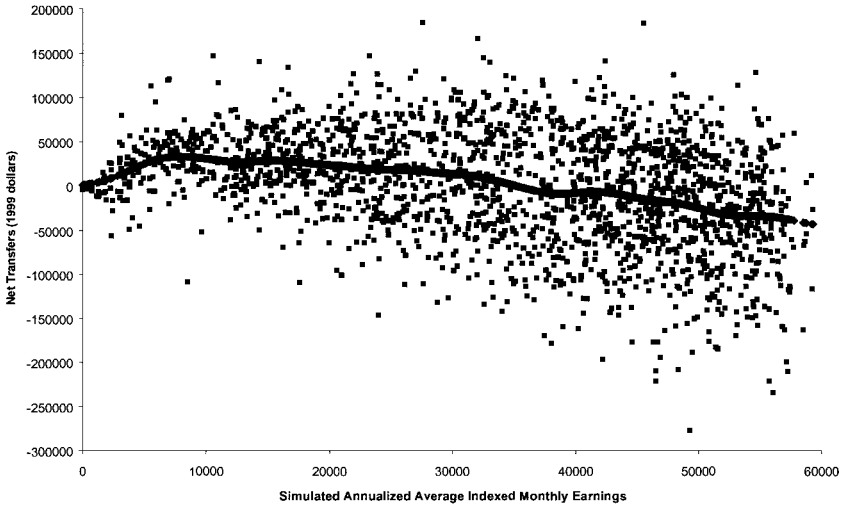

Fig. 1.2 Net transfers from Social Security by income, all individuals
Source: See figure 1.1.
Note: The points have been randomly jittered to preserve confidentiality.

in the same household—the wives receive larger transfers due to their longer life expectancies. This source of variation is highlighted in panels A and B of figure 1.3, which separates the male and female observations from figure 1.2 into separate plots. However, substantial variation remains in transfers at a given AIME even when one looks only at males. This variation is due to differences in life expectancies, marital status, the level of earnings of secondary earners, the share of earnings earned in years outside of the highest thirty-five years, and the timing of earnings over the lifetime.

Despite the wide spread of transfers at a given level of annualized AIME, it is important to emphasize that the kernel regression line in figure 1.2 showing mean transfers at a given level of income declines steadily with income (although the decline is not nearly as steep as the theoretical decline shown in figure 1.1). The regression line reaches a maximum of around $33,000 at an annualized AIME of $8,000 and falls to roughly −$25,000 at $50,000 of annualized AIME.

Figure 1.4 shows the distribution of internal rates of return from Social Security for the same sample. The average internal rate of return falls from around 4 percent down to around 1 percent as incomes rise. As with the transfer plots, there is wide variation in internal rates of return at a given level of AIME.

As discussed above, different definitions of income can lead to different interpretations of the strength of the relationship between income and the

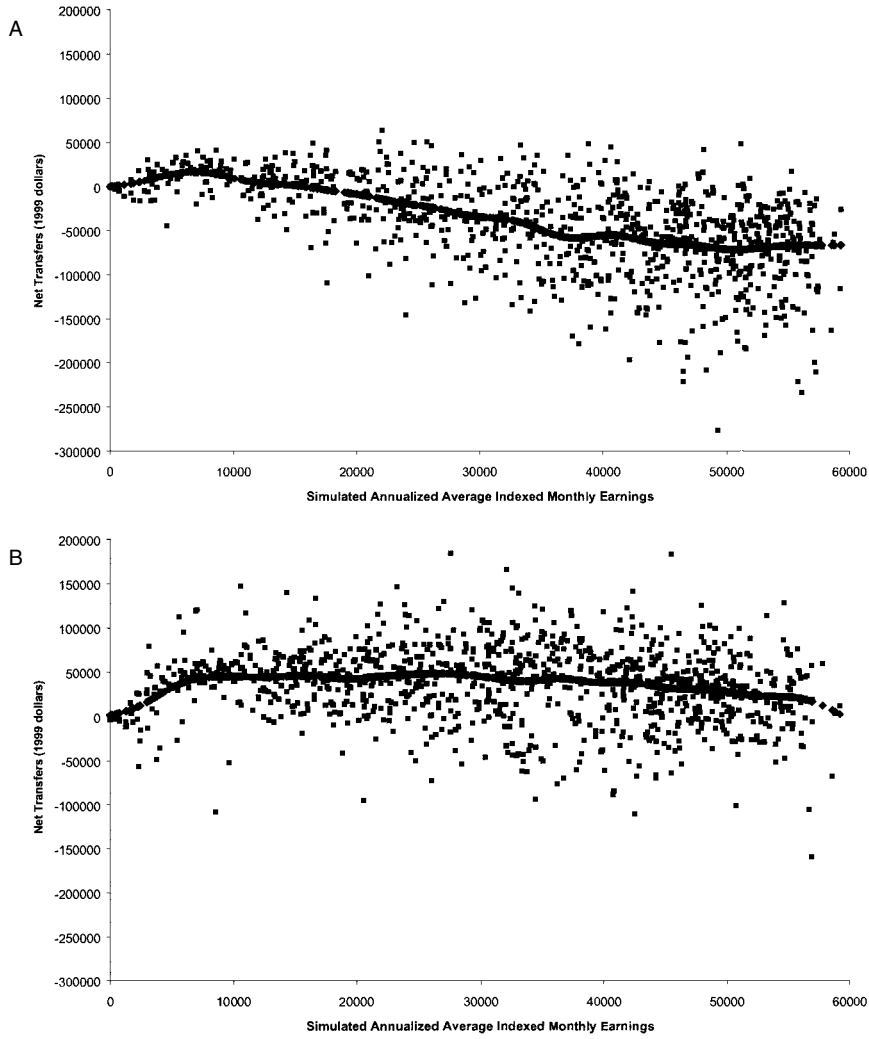

Fig. 1.3 Net transfers from Social Security by income: *A*, males; *B*, females.
Source: See figure 1.1.
Note: The points have been randomly jittered to preserve confidentiality.

transfers from Social Security. In figure 1.2, many of the individuals receiving very low transfers are people in married couples in which the secondary earner has substantial earnings. If the earnings of these secondary earners were included in the definition used for ranking household income, then these low-transfer families would be considered to have higher incomes, and the transfers would appear more progressive overall. Figure

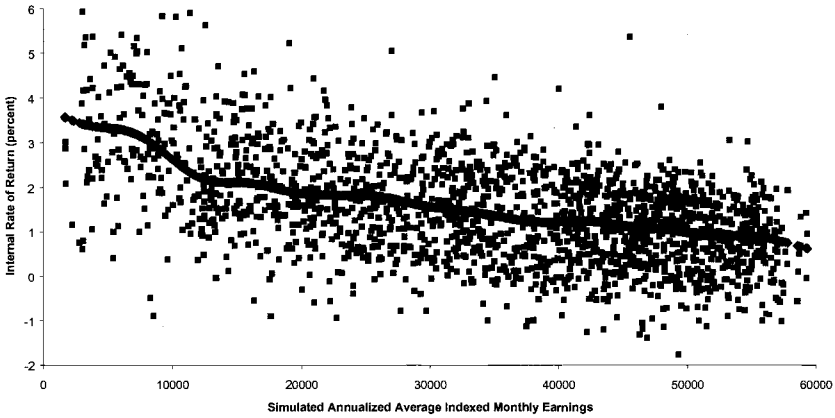

Fig. 1.4 Internal rates of return from Social Security by income
Source: See figure 1.1.
Note: The points have been randomly jittered to preserve confidentiality.

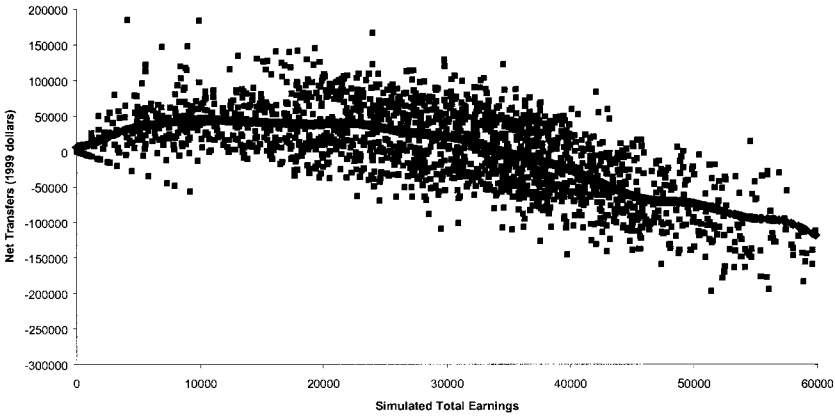

Fig. 1.5 Net transfers from Social Security by income, all individuals
Source: See figure 1.1.
Note: The points have been randomly jittered to preserve confidentiality.

1.5 shows transfers graphed against the total average annual earnings of both spouses. In addition to including the earnings of both spouses, it also includes all years of earnings, not just the highest thirty-five. The spread of transfers at a given level of earnings is now much tighter, largely because people with low returns due to a large amount of earnings that produce little or no marginal Social Security benefits are now classified as having higher earnings. To the extent that variations in earnings from secondary earners reflects a choice between home and market production rather than a difference in earning capacity, this total earnings measure of income may

be a less satisfactory metric for ranking people than the measure based on the AIME of the primary earner.

The difference between the two measures of income can be seen in the first part of table 1.2, which presents internal rates of return, mean transfers, and lifetime net tax rates by income quintile under the two definitions of income. The first column presents the average annual earnings by quintile. The numbers for all beneficiaries and for the AIME quintiles are the AIME of the highest earner in the household, and therefore correspond to the results in figures 1.2 through 1.4. The last five rows use the total earnings measure, as in figure 1.5. Note that the average income under the more comprehensive measure can be lower than that in the less comprehensive measure because it is averaged over more years. The second column presents the average internal rate of return from Social Security by income quintile. These average rates of return are person weighted, not dollar weighted, and therefore the average internal rate of return for all beneficiaries (1.53 percent) exceeds the aggregate cohort rate of return (1.29 percent) mentioned above. Rates of return range from 2.70 to 0.85 for the AIME measure of income, and from 3.06 to the 0.35 for the total earnings measure. Thus low-income individuals clearly receive a higher rate of return from Social Security than higher-income individuals, and the difference between the rates of return of high-income and low-income individuals is greater when the individuals are ranked by total earnings than when they are ranked by the AIME of the primary earner.

The remaining six columns in the first part of table 1.2 show the net transfer from Social Security evaluated at age sixty-five and the lifetime net tax rate from Social Security. Results from each of these two measures are presented using discount rates of 1.29 percent (the cohort internal rate of return), 3 percent, and 5 percent. The lifetime net tax rate is calculated by dividing the net transfer from Social Security by the present value of lifetime covered earnings.[26]

At a discount rate of 1.29 percent, individuals in the lowest AIME quintile receive $26,375 more in Social Security benefits than they pay in taxes, and those in the 2nd quintile receive a net transfer of $17,932. In contrast, individuals in the highest AIME quintile pay $33,571 more in taxes than they receive in benefits. Those in the lowest quintile receive a net subsidy from Social Security equal to 6 percent of lifetime earnings, and those in the 2nd quintile receive a net subsidy of 1.7 percent, while those in the highest quintile face a net tax from Social Security equal to 2 percent of lifetime earnings.

It is worth noting that the composition of the lowest AIME quintile is

26. Because the denominator in this calculation is *covered* earnings, the lifetime net tax rates rise monotonically by income group. A measure of lifetime net tax rates that included earnings above the maximum level on which Social Security taxes are assessed would start to decline at income levels above the taxable maximum.

Table 1.2 **Redistribution from Social Security in the Simulated 1925–29 Cohort**

	Average Annual Earnings	Average Internal Rate of Return (%)	1.29% Discount Rate		3% Discount Rate		5% Discount Rate	
			Average Net Transfer ($)	Lifetime Net Tax Rate (%)	Average Net Transfer ($)	Lifetime Net Tax Rate (%)	Average Net Transfer ($)	Lifetime Net Tax Rate (%)
All beneficiaries	33,961[a]	1.53	0	0	−119,897	6.6	−330,831	10.9
	(349)	(0.03)			(2,206)		(4,273)	
			By Income Quintiles					
Lowest AIME quintile	10,434[a]	2.70	26,375	−6.0	−22,103	3.3	−104,700	9.2
	(276)	(0.08)	(1,709)		(2,298)		(4,793)	
Second AIME quintile	25,338[a]	1.71	17,932	−1.7	−87,150	5.6	−268,302	10.3
	(178)	(0.06)	(2,569)		(3,707)		(6,798)	
Third AIME quintile	36,735[a]	1.32	−2,045	0.2	−137,748	6.7	−377,008	10.9
	(151)	(0.05)	(3,346)		(4,594)		(7,822)	
Fourth AIME quintile	45,379[a]	1.16	−10,184	0.7	−160,330	7.0	−426,581	11.1
	(112)	(0.05)	(3,400)		(4,369)		(7,162)	
Highest AIME quintile	52,935[a]	0.85	−33,571	2.0	−196,230	7.9	−486,393	11.5
	(125)	(0.04)	(3,251)		(4,082)		(6,771)	
Lowest total earnings quintile	11,791[a]	3.06	38,516	−9.9	−4,887	0.8	−72,874	7.6
	(380)	(9.08)	(1,920)		(1,706)		(2,902)	
Second total earnings quintile	27,746[a]	1.89	34,906	−3.8	−63,129	4.5	−224,223	9.7
	(408)	(0.04)	(2,182)		(2,102)		(2,480)	
Third total earnings quintile	38,880[a]	1.46	14,836	−1.2	−114,118	6.0	−337,143	10.6
	(455)	(0.03)	(2,208)		(2,169)		(2,381)	
Fourth total earnings quintile	45,528[a]	1.03	−14,535	1.0	−163,556	7.2	−432,772	11.2
	(431)	(0.03)	(2,285)		(2,055)		(2,199)	
Highest total earnings quintile	46,230[a]	0.35	−75,256	3.9	−257,261	8.9	−594,333	12.1
	(407)	(0.03)	(2,644)		(3,250)		(5,291)	

By Demographic Characteristics								
Men	36,002[a]	0.78	−43,108	3.2	−169,944	8.4	−400,750	11.8
	(514)	(0.03)	(1,692)		(3,240)		(6,564)	
Women	32,207[a]	2.18	37,047	−3.4	−76,887	4.7	−270,743	9.9
	(468)	(0.03)	(1,293)		(2,298)		(4,892)	
White	35,117[a]	1.52	205	0.0	−122,827	6.6	−339,317	10.9
	(355)	(0.03)	(1,456)		(2,303)		(4,433)	
Black	19,798[a]	1.64	−2,514	0.3	−84,001	6.7	−226,852	10.9
	(1,032)	(0.12)	(4,241)		(7,143)		(13,644)	
Hispanic[c]	19,328[a]	2.46	14,249	−1.9	−57,480	5.3	−178,509	10.0
	(1,198)	(0.19)	(4,860)		(8,486)		(17,052)	
Less than high school	27,640[a]	1.63	810	−0.1	−104,447	6.6	−290,876	10.9
	(515)	(0.05)	(2,162)		(3,551)		(6,967)	
High school	36,541[a]	1.46	−693	0.1	−128,304	6.7	−353,529	10.9
	(494)	(0.04)	(2,119)		(3,291)		(6,260)	
More than high school	42,386[a]	1.46	−10	0.0	−134,285	6.5	−365,204	10.8
	(809)	(0.06)	(3,371)		(5,129)		(9,669)	

Sources: This and following tables are derived from author's calculations from a match of the 1990 and 1991 panels of the Surveys of Income and Program Participation to Social Security administrative records.

Notes: Standard errors in parentheses. Dollar amounts are in 1999 dollars. Net transfers and lifetime net rate are accumulated to age 65.

[a]Average annual earnings measured as the annualized AIME. For married couples it is the AIME of the higher earner in the couple.

[b]Average annual earnings measured by the total earnings of the worker accumulated at the cohort rate of return. For married couples it is the sum of the earnings of the two spouses.

[c]Can be any race.

quite different from that of the other quintiles. Of the primary earners in the first quintile, 56 percent had fewer than thirty-five years of work in covered employment, compared with 22 percent in the 2nd quintile, 13 percent in the 3rd quintile, and less than 2 percent in the 4th and 5th quintiles. Of people in the 1st quintile, 20 percent are immigrants, compared with 5 percent in the other four quintiles. As Gustman and Steinmeier (1998) have shown, immigrants receive a very good deal from Social Security because they are credited with zeros in their earnings records for the years before they came to the United States, thereby appearing to have low lifetime earnings and benefiting from Social Security's progressive benefit formula. Many of the nonimmigrants in this 1st quintile are likely to have worked in noncovered sectors of the economy, and therefore their years with zero earnings are not true zeros.[27] Thus, an argument could be made for ignoring the results for the lowest-income quintile and focusing on the remaining four quintiles.

At higher discount rates, all income quintiles have negative transfers from Social Security on average, and the spread between the average transfers at different income levels grows. For example, at a discount rate of 1.29, there is a $51,000 difference in net transfers between the 2nd and 5th AIME quintiles; at a discount rate of 3 percent, this difference reaches $109,000; and at a discount rate of 5 percent it reaches $218,000. With the higher discount rates, lifetime net tax rates are positive at all income levels, but the variation in lifetime tax rates by income levels falls since with higher discount rates the progressive benefits (which occur later than the taxes) are reduced in importance relative to the proportional Social Security tax.

The second part of table 1.2 presents the analogous results broken down by sex, race, and level of education. As would be expected due to their lower mortality rates, women receive substantially larger transfers and rates of return than men. Discounted at the cohort rate of return of 1.29 percent, the average transfer for women is $37,047, while the average for men is −$43,108. Women receive a rate of return on the Social Security contributions of their household of 2.18 percent, compared with 0.78 percent for men.

Surprisingly, differences in transfers across race and education groups are generally not statistically significant, and differences in rates of return for these categories are only of borderline significance. For example, blacks receive an internal rate of return of 1.64 percent, compared to 1.52 percent for whites. The first column shows that AIMEs do differ substantially by race and education, but the progressive benefit formula is completely offset by the higher mortality in the lower-income groups. This can be seen

27. I attempted to exclude government workers (who in the past were not covered by Social Security) from my sample by dropping observations for individuals who could be identified in the SIPP work history topical module as having worked in the public sector or who were receiving income from a government pension. However, this procedure presumably did not identify all workers with public-sector experience.

Table 1.3 The Impact of Differential Mortality on the Redistribution from Social Security

	Using Mortality Tables that Vary by Age, Sex, Race, and Education		Using Mortality Tables that Vary by Only Age and Sex[a]	
	Internal Rate of Return (%)	Net Transfer at 1.29% Discount Rate	Internal Rate of Return (%)	Net Transfer at 1.29% Discount Rate
White	1.52	205	1.59	3,174
	(0.03)	(1,456)	(0.03)	(1,390)
Black	1.62	−2,514	2.19	18,259
	(0.12)	(4,241)	(0.11)	(3,453)
Hispanic[b]	2.46	14,249	2.70	22,664
	(0.19)	(4,860)	(0.18)	(4,461)
Less than high school	1.63	810	1.88	12,103
	(0.05)	(2,162)	(0.05)	(1,939)
High school	1.46	−693	1.52	1,905
	(0.04)	(2,119)	(0.04)	(2,008)
More than high school	1.46	−10	1.35	−8,355
	(0.06)	(3,371)	(0.07)	(3,483)

Source: See table 1.2.

Note: Standard errors in parentheses.

[a]Applies mortality tables for all white males and females to entire population.

[b]Can be any race.

clearly in table 1.3, which reproduces selected internal rate of return and net transfer results from table 1.2 and then adds results using mortality tables that vary only by sex (and not by race or education).[28] Whereas rates of return in different race and education groups are indistinguishable once differential mortality is accounted for, with uniform mortality rates low-income groups, such as blacks and people with less than high school education, have higher internal rates of return and transfers than the groups with higher average earnings.

In both sets of columns, Hispanics have returns and transfers significantly above those for whites and blacks. In this cohort, a large share of the Hispanics are immigrants, and as mentioned above, the progressive benefit formula strongly advantages immigrants with short periods of covered employment. In fact, the transfers for Hispanic immigrants are likely to be understated in these results. While precise lifetables for U.S. Hispanics are difficult to construct, the available evidence suggests that U.S. Hispanics (particularly Hispanic immigrants) have lower mortality rates than those for non-Hispanic whites, and my results do not take into account these lower mortality rates.[29]

28. Specifically, all men are assigned the white male mortality table and all women are assigned the white female mortality table.

29. For evidence on Hispanic mortality, see Sorlie et al. (1993) and Hummer et al. (1999).

1.5.2 Factors Offsetting Income-Related Redistribution

Table 1.4 contains results analyzing the extent to which spouse and survivor benefits and differential mortality reduce the amount of income-related redistribution accomplished by Social Security. The first column of the table contains the present value of Social Security taxes for each income quintile.[30] The second column contains the present value of Social Security benefits under two counterfactual assumptions. First, it calculates Social Security benefits with individuals receiving only their retired worker benefit and not spouse or survivor benefit. Second, it assumes that mortality rates vary only by sex and age and not by race and education. Thus, this column describes what the distribution of Social Security benefits would be if differential mortality and spouse and survivor benefits did not exist.

The next two columns remove each of these two counterfactual assumptions one at a time. Column (3) shows benefit levels with spouse and survivor benefits added in, but retaining the counterfactual assumption that mortality rates vary only by sex and age. Thus, the difference between column (3) and column (2) shows the impact of spouse and survivor benefits. Because spouse benefits are 50 percent of the benefit of the retired worker to whom the spouse is married, and survivor benefits are 100 percent of the benefit of the deceased retired worker, the size of these benefits is higher for those in the higher AIME quintiles. On average, individuals in the lowest AIME quintile gain $27,776 from the introduction of spouse and survivor benefits, individuals in the middle quintile gain $46,889, and individuals in the highest AIME quintile gain $52,158. Thus one could argue that the Social Security system implicitly values the time out of the labor force of women married to high-earning men more than that of women married to lower earners.

Viewed as a percentage increase, however, spouse and survivor benefits simply lead to an equal percentage increase in benefits across most of the quintiles, with a somewhat higher percentage increase in the benefits of the lowest-earning group. The bottom panel of the table shows benefit levels for each earnings quintile scaled so that the benefits for each group in column (2) equal 100. Introducing spouse and survivor benefits increases benefit levels by about 30 percent in the four highest quintiles and by about 40 percent in the lowest quintile. Thus, in evaluating the distributional implications of spouse and survivors benefits, one needs to have in mind a specific alternative for the extra revenue if it were not used for

30. These are the same values for Social Security taxes that underlie the basic results in tables 1.1 and 1.2. Mortality assumptions affect Social Security tax payments because my model incorporates the impact of mortality before age sixty-five. However, because the impact of different mortality assumptions on the present value of Social Security taxes paid by different income quintiles is extremely small, I ignore this effect in this table.

Table 1.4 **The Impact of Spouse Benefits and Differential Mortality on Income-Related Redistribution from Social Security**

		Present Value of Social Security Benefits		
	Present Value of Social Security Taxes	Using Mortality Tables Differing Only By Sex and Age, Assuming No Spouse or Survivor's Benefits	Using Mortality Tables Differing Only by Sex and Age	Using Mortality Tables Varying by Sex, Age, Race, and Education
All beneficiaries	184,413	140,283	184,413	184,413
Lowest AIME quintile	68,240	68,601	96,377	94,615
Second AIME quintile	158,675	137,918	178,014	176,606
Third AIME quintile	209,206	160,311	207,200	207,161
Fourth AIME quintile	231,752	166,345	220,663	221,568
Highest AIME quintile	258,485	170,333	222,491	224,915
			Scaled Benefit Levels	
Lowest AIME quintile		100	140.5	137.9
Second AIME quintile		100	129.1	128.1
Third AIME quintile		100	129.2	129.2
Fourth AIME quintile		100	132.7	133.2
Highest AIME quintile		100	130.6	132.0

Source: See table 1.2

Note: All present values are as of age 65.

these benefits. If the alternative were a proportional increase in all benefits or a reduction in the payroll tax, spouse benefits would have little impact on the amount of redistribution that occurs through Social Security. If the alternative is to raise the benefits or reduce the taxes of each beneficiary by an equal dollar amount, then spouse and survivor benefits cause substantial redistribution toward high-income households.

Differential mortality has a smaller impact on benefits levels, causing average lifetime benefits to fall in the lowest AIME quintile by about $3,330, or about 2 percent. In contrast, benefits rise in the highest AIME quintile by $2,424, or about 1 percent. These effects are somewhat smaller than the effects on education and race groups shown in table 1.3 because the income groups contain a mixture of the various race and education groups. Recent research by Deaton and Paxson (2001) suggests that income has a direct impact on mortality independent of race and education. Incorporating this direct effect of income would increase the effect of differential mortality on the benefit levels of the different income quintiles.

1.5.3 How Much Income-Related Redistribution is There?

The scatter plots and means make it clear that there is both a substantial amount of income-related redistribution occurring through Social Security and a substantial amount of redistribution that is not income related. However, the results presented so far do not provide a clear measure of the redistribution's total magnitude. While no summary measure of redistribution is perfect, a sense of the total magnitude is useful for understanding how important the income redistribution from Social Security is relative to other U.S. income-transfer programs and for considering how large an income-based transfer system would be needed to supplement an individual account-type Social Security system in order to preserve the current level of income-based redistribution.

The first row of table 1.5 shows that the present value of total Social Security benefits per birth year in my simulations is $460 billion.[31] Adding up the total transfers received by individuals receiving more than the cohort rate of return (which is also equal to the negative transfers of those receiving less than the cohort rate of return) results in total transfers of $60 billion, roughly 13 percent of total benefits. To measure the portion of these transfers that are income related, I replace each individual's transfer with the predicted transfer for a person of that income estimated by the kernel regression lines through the scatter plots in figures 1.2 and 1.5.[32] Adding up the income-related transfers calculated in this way produces an

31. This is an average over the five birth years, in 1999 dollars, discounting at the cohort rate of return of 1.29 percent.

32. An equivalent way to describe this measure of income-related transfers is that it is the total of all the transfers from individuals at income levels above the point where the average transfer becomes negative to people at income levels below that point.

Table 1.5 **Measuring Aggregate Income-Related Redistribution from Social Security**

	1.29% Discount Rate		3% Discount Rate		5% Discount Rate	
	$ billions	Share of Total Benefits (%)	$ billions	Share of Total Benefits (%)	$ billions	Share of Total Benefits (%)
Total present discounted value of benefits per birth year	460	100	396	100	342	100
Total transfers	60	13	99	25	192	56
Total income-related transfers using AIME measure of income	23	5	65	17	143	42
Total income-related transfers using total income measure of income	42	9	90	23	185	54

Source: See table 1.2.

estimate of $23 billion in income-related transfers under the AIME measure of income and $42 billion under the total-income measure of redistribution, suggesting that between 38 and 70 percent of Social Security transfers and between 5 and 9 percent of Social Security benefits go for income-related transfers. OASI benefit payments in 2001 are projected to be $373 billion dollars. Therefore, 5 to 9 percent would be between $19 and $34 billion of annual income-related transfers.

This measure of income-related transfers is quite sensitive to the discount rate used. At a discount rate of 3 percent, income-related transfers are between 17 and 23 percent of benefits, while at a discount rate of 5 percent they are between 42 and 54 percent.[33] This result is closely related to the point made earlier about the important interactions between intercohort and intracohort redistribution. When the interest rate used to discount Social Security benefits and taxes is lower than the cohort rate of return (as was the case for some early generations of beneficiaries), dollar measures of intracohort redistribution look regressive, because a large share of the windfalls go to upper-income beneficiaries with high benefit levels. In contrast, when the discount rate is above the cohort rate of return, dollar measures of the progressivity of the system show the high-

33. For discount rates above 1.29 percent, aggregate transfers are negative rather than zero. For these calculations, transfers for each individual are measured relative to the average dollar transfer for the cohort.

income individuals who pay higher amounts of taxes losing the most from the low return on these tax payments.

In interpreting these results it is important to remember that the income transfers from Social Security differ in a number of important ways from transfers in other programs. First, because Social Security transfers vary so much at each income level, crediting Social Security for accomplishing the mean transfer at each income level exaggerates its effectiveness relative to other income-transfer programs that give everyone at a given income level the intended transfer.[34] That said, there are also advantages of transfers through Social Security. Lifetime income is almost surely a better measure of a person's true ability than income in a single year, and it is possible that redistribution that occurs after retirement results in less distortion of labor supply than redistribution that occurs during working years. Moreover, some of the redistribution that occurs for non–income-related reasons, like rewarding people with long life expectancies, could be desirable if the goal is to ensure a constant replacement rate throughout retirement.

1.6 Discussion

Three other papers have recently provided evidence on the amount of redistribution occurring through Social Security.[35] Although the papers use different microsimulation models and often present different measures of redistribution, the results, when comparable, are quite similar to the ones in this paper and together suggest a consistent picture of Social Security's distributional effects. Caldwell et al. (1999) use a microsimulation model based on projections of marriage and earnings patterns for postwar generations. The net tax rates that they calculate for the 1990 birth cohort (the cohort whose mortality patterns my results are calibrated to) range from 6.2 percent in the first income decile to 8.9 percent in the 6th income decile (and then fall in the upper deciles because their measure of income is not capped at the Social Security taxable maximum).[36] These net tax rates are somewhat lower than mine because Caldwell et al. assume a 14.6 percent OASI payroll tax in the long run, while I assume a 15.4 percent tax rate. Gustman and Steinmeier (2001) use a microsimulation model based on the Health and Retirement Survey. They emphasize that Social Security looks less progressive after one groups individuals into house-

34. That is, the added variance from the Social Security transfers reduces utility relative to a transfer that provided everyone at the income level with the mean transfer for that income level.

35. The main work on all three of these projects occurred contemporaneously with my work, and the various authors were not aware of each other's projects until the papers were first presented.

36. These results come from discounting at a 5 percent rate of return.

holds and adjusts for variation in secondary earner levels than it does when one looks simply at retired worker benefits. Using a family measure of lifetime income that averages only those years with significant earnings, they find that the redistribution from Social Security increases benefits in the 2nd decile by 7 percent and reduces them by 7 percent in the 9th decile. Coronado, Fullerton, and Glass (2000) project future earnings and marriage patterns for a PSID-based sample. Ranking households by potential earnings and taking into account the fact that wages above the taxable maximum are not taxed, they conclude that, at a sufficiently high discount rate, Social Security is slightly regressive.

There are two important implications of my findings for Social Security reform. First, they suggest the magnitude of redistribution that an individual account–based plan would need to achieve in order to maintain the current level of redistribution from rich to poor. If distributionally neutral individual accounts completely replaced Social Security, the equivalent of $20 to $30 billion per year of redistribution from people with high lifetime earnings to people with low lifetime earnings would be required to maintain current levels of redistribution. In a distributionally neutral mixed plan in which individual accounts were responsible for only around one-third of the retirement income from Social Security, the equivalent of $7 to $10 billion per year in transfers would be required. However, because most individual account plans would mandate at least partial annuitization, such plans would not be distributionally neutral and would produce the same redistribution from short-lived to long-lived groups that occurs in the current system. This means that several billion additional dollars of transfers would be needed in an individual account plan in order for it to match the redistribution of the current system. Such transfers could be implemented in many ways. For example, contributions to individual accounts could be made in a redistributive way; payouts from the accounts of high earners could be taxed to subsidize payouts from the accounts of low earners; or general revenues could be used to provide supplemental payments to lower earners.

The second implication of these results for Social Security reform is that if no explicit steps are taken in an individual account–based plan to redistribute to groups with low life expectancies, then these groups could end up doing substantially worse than they do under the current system. In particular, blacks and high school dropouts currently receive rates of return from Social Security that are roughly the same as the population average, because the progressive benefit formula offsets the impact of their relatively high mortality rates. If an individual account–based plan required annuitization at a single price for everyone in the population, then the same effect of mortality on benefit payments would occur as in the current system, but there would not be the progressive benefit formula to

offset it. Providing explicit redistribution as part of the individual accounts would be one way to ensure that these groups are not made worse off by Social Security reform. Other ways of offsetting the mortality effects include providing for bequests and coming up with sufficient additional resources in funding the account so that retirement income levels are preserved (see Feldstein and Liebman, chapter 7 in this volume).

In addition, these findings raise the question of how the Social Security benefit formula might be modified to align its distributional impact more closely with the theoretical impact shown in figure 1.1. There are two aspects to this modification: changing the average level of redistribution at different income levels and reducing the spread of transfers at a given income level. It would be relatively straightforward to increase transfers at low income levels and reduce them at higher income levels. The 90 percent factor in the PIA formula could be increased and the 32 and 15 percent factors reduced. Alternatively, if the goal was to concentrate the benefit increase on low earners, but not the atypical low earners in the 1st quintile, the range over which the 90 percent benefit factor applies could be extended, or a fourth range between 90 and 32 could be introduced.

Reducing the variation in transfers at a given level of income is more difficult and in some cases may not be desirable. Any retirement system that requires people to annuitize at a single rate will redistribute from those with short life expectancy to those with long life expectancy. One view of this sort of redistribution is that the correlation between income and life expectancy leads to perverse transfers from lower lifetime-income groups to higher lifetime-income groups. However, it is also possible to view people with longer life expectancies as having greater resource needs, in which case some redistribution to them could be desirable. Although it is unlikely that the political system would ever explicitly provide higher benefit levels for groups with lower life expectancy, adding bequest options similar to the ten-year certain options in private annuity plans would increase transfers to demographic groups with high mortality rates.[37] Reducing transfers between households with working and nonworking spouses could be accomplished by reducing spouse benefits (for example, by capping them at 50 percent of the PIA of the average earner) and raising worker benefits. Alternatively, secondary earners could receive a federal income tax credit for their payroll taxes at the end of the year. Because female earnings levels have increased in more recent cohorts, the importance of spouse benefits will decrease over time, and by some measures the progressivity of Social Security will increase.

37. If total benefits were held constant, providing bequests would of course require a reduction in retirement benefit levels.

1.7 Conclusion

Social Security provides income-related transfers that are between 5 and 9 percent of Social Security benefits paid, or $19 to $34 billion, at 2001 aggregate benefit levels (discounting at the 1.29 percent rate of return on Social Security earned by the microsimulation sample in this study). However, the range of transfers received at a given level of average lifetime income is quite wide. This wide variation is due to different mortality rates for people in different demographic groups, to variation in earnings levels by secondary earners, and to marital status differences, among other factors.

These results indicate that the income-based redistribution in the current Social Security system is fairly modest compared to the total benefits paid. However, it is worth emphasizing that income redistribution is only one of the benefits provided by Social Security, and some of the other benefits—such as the inflation-protected annuity and absence of market risk—may be particularly valuable to low-income families. Therefore, when we compare alternative systems to the current Social Security system, it will be important to determine not only whether they can raise the incomes and lower the poverty rates of low-income families, but also that they can provide a comparable amount of income security.[38]

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38. Feldstein and Liebman (chapter 7 in this volume) show that a mixed plan adding 3 percent individual accounts on top of a pay-as-you-go system that continues to be funded with 12.4 percent of payroll can, in the long run, substantially reduce the percentage of Social Security recipients with benefits below the poverty line.

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Comment Gary Burtless

Jeffrey Liebman has written a very lucid, well-conceived, and sensibly executed chapter. Although it may not be apparent to most readers, the tabulations he performs are extremely difficult, not least because they are based on data in a complex file containing information from both the Survey of Income and Program Participation files (SIPP) and Social Security Earnings Records (SSER). These merged records contain confidential earnings data and are therefore rarely examined by academic researchers. Liebman's tabulations shed highly revealing light on some of the important income redistributive effects of the existing Social Security system.

My remarks will focus on one main question: How should we think about Liebman's analytical framework in comparison with other possible ways of viewing Social Security's redistributive effects?

The chapter's basic goal is to uncover the pattern of *within*-generation redistribution produced by the Social Security system. In particular, Liebman tries to highlight the pattern of redistributive Social Security impacts on lifetime or permanent income. Naturally, the findings of the paper reflect the framework in which they are derived. They provide estimates of redistribution within only one possible framework. Different frameworks would reveal a different set of redistributive impacts.

To take a trivial example, Liebman focuses on within-generation redistribution. He could extend the analysis, as many others have done, to examine the impacts of the system on *cross*-generational income distribution. Many critics of Social Security point out that the cross-generational redistribution sometimes benefits the better off at the expense of the less well off. High-income members of generations that received generous net transfers from Social Security, especially the generations that began collecting pensions before 1980, have obtained generous net transfers partly at the expense of low-income people in generations that will pay net taxes to Social Security. It is nonetheless the case that the system on average

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provided transfers to earlier and poorer generations at the expense of later and richer generations. Moving to an advance funded, defined-contribution system and phasing out the pay-as-you-go system would eventually eliminate this kind of cross-generational redistribution and, with it, a type of redistribution that on average has favored the less well off. Liebman's analysis will miss this kind of redistribution.

Liebman could also extend the analysis, as the Office of the Actuary has attempted to do, to account for all of the insurance components financed by the OASDI tax. Disability Insurance (DI) and early Survivors Insurance benefits can begin long before age sixty, which is the earliest age at which the OASDI benefit stream enters Liebman's calculations. Some early benefits last long after age sixty, and these, too, are missed in Liebman's analysis. For example, the DI pension is converted to an Old-Age Insurance (OAI) pension when the disabled worker reaches the normal retirement age. The OAI pension is much higher than it would be in the absence of the DI program, however, because under the regular OAI benefit formula all of the years of postdisability low earnings would be counted when determining the pension. Simlarly, the survivor's pension that is based on a DI pension is usually higher than an ordinary survivor's pension. As the chapter notes in passing, the lifetime redistributive effects of DI and early survivors' pensions are much more helpful for people with low lifetime incomes than are ordinary OAI pensions, which naturally favor people with longer than average life expectancies. Thus, a lifetime analysis of all the components of OASDI would show redistributive effects that are much more favorable to people with low permanent income, who tend to become disabled and leave young survivors much more frequently than people with high permanent income (see Leimer 1999).

Finally, one can examine the redistributive impacts of Social Security from a one-year rather than a lifetime perspective. In response to my suggestion at the conference, Liebman has now added a table to the chapter with some one-year estimates. These estimates provide evidence on questions such as whether the people who pay OASDI taxes *this year* have higher net incomes than the people who collect this year's OASDI benefits, and how much the transfers shift this year's income distribution. All empirical studies known to me show that Social Security benefits are very important in reducing the inequality of this year's income, and Liebman's estimates confirm this as well (see Danziger and Weinberg 1994). They are probably more important, in fact, than the income tax in reducing the inequality of net income. If we permitted taxpayers to keep their OASDI taxes and withheld OASDI pensions from current beneficiaries, we would tilt the income distribution in favor of higher-income people and greatly expand the ranks of the poor. Even though the OASDI payroll tax is often criticized as regressive, it is progressive up to a family income of about $100,000 or $125,000 a year, primarily because wage and self-employment

income (which is taxable under OASDI) represents a rising percentage of family income up through those income levels.

I recognize that one-year accounting perspectives are not very fashionable in economics. Most of us are confident that the longer-term (especially the lifetime) perspective is more illuminating when we think about income redistribution. The retired seventy-year-old often has less current income than the working thirty-five-year-old, but the *permanent* income of the seventy-year-old might easily be higher. In a lifetime perspective, it is bad redistributive policy for the lower-permanent-income thirty-five-year-old to be transferring resources to the higher-permanent-income seventy-year-old. (Liebman essentially measures permanent income using Average Indexed Monthly Earnings, or AIME.)

In one sense, this reasoning is beyond reproach, but in another it is highly misleading. One reason we have a Social Security system is the view that people will not take sensible precautions to insure themselves against known risks to themselves and their families—risks such as early death, disability, retirement, and extremely long life spans. When these risks become realities, many people are caught flat-footed and find themselves with too little savings to support themselves. Social Security requires workers to purchase insurance that partially protects them against these risks. The Social Security system imposes taxes on low-permanent-income thirty-five-year-olds to finance transfers to high-permanent-income seventy-year-olds. The transfers prevent high-permanent-income seventy-year-olds from becoming low-*actual*-income seventy-year-olds. To a large extent, this transfer mechanism succeeds in holding down poverty among aged and disabled Americans, including retired and disabled Americans who had middle-class incomes when they were at work. Liebman's analysis largely misses this redistributional effect of Social Security. It is a view of redistribution that rests on the plausible but incorrect theory that, in the absence of Social Security, workers would have successfully smoothed their consumption over their lifetimes. Many would have smoothed their consumption, but workers who would have failed to do so are protected by Social Security.

In interpreting the aggregate amount of redistribution that Liebman attributes to Social Security, it is important not to make the mistake of comparing this sum directly to the annual expenditures on other transfer programs. Consider the Earned Income Tax Credit (EITC), for example. From a lifetime perspective, many EITC recipients have incomes above the one-year threshold for EITC eligibility, and many of the people who pay additional income taxes to finance the EITC, including low-income childless workers, have incomes below the EITC eligibility threshold. Thus a sensible comparison would require taking the lifetime perspective on other transfer programs as well.

However, we will move away from the redistributive analyses that Jeff

Liebman did not perform to focus on the one he actually did. His interest is on the within-generation impacts of the system from a truncated lifetime perspective (truncated because it ignores benefits contributors obtain before age sixty). Contributors pay taxes while they are at work and collect benefits starting some time after age sixty. Liebman can easily calculate the return workers obtain on their taxes, given a convention for counting taxes and benefits. In Liebman's main analysis, if a worker's return exceeds her generation's average, she has obtained a net transfer. If her internal rate of return falls short of her generation's average, she has paid net taxes to the system.

Note that this is a different concept of net taxes and transfers than the one adopted by Jagadeesh Gokhale and Larry Kotlikoff in another paper at this conference. They use a benchmark ("fair market") discounting factor to assess contributions and benefits. If a worker's return falls short of this benchmark, she is classified as a net taxpayer. Since Gokhale and Kotlikoff use a benchmark return that is far higher than the average internal rate of return actually realized on Social Security contributions, they find a much higher percentage of contributors in each generation to be net taxpayers.

As noted, Liebman must establish a convention for counting a worker's taxes and contributions, that is, for assigning total contributions and benefits to individual workers. Liebman's convention is to assign to a worker all the worker's taxes when she is single and half her contributions when she is married. In addition, Liebman assigns to a person half the spouse's contributions when the person is married. An identical convention is used to assign benefits to individuals. All of individual *i*'s benefits when person *i* is single, and half the combined husband-wife benefits when person *i* is married, are assigned to person *i*.

This is a straightforward and illuminating way to assign contributions and benefits, but it is not necessarily compatible with the philosophy behind the program. Social Security sometimes bases a person's benefits on the person's own earnings record and sometimes on the earnings record of another family member. The architects seem to have had in mind an insurance scheme in which contributors earned rights to benefits under designated circumstances (insurable events). When a sixty-one-year-old married contributor is taken to the undertaker, he bequeaths benefit entitlements to specified dependents (including his spouse). Franklin D. Roosevelt and Congress probably believed the stream of benefits flowing to the contributor's survivors was generated by the earlier stream of contributions made by the deceased worker. In the example I have just given, however, Liebman would assign one-half the worker's tax contributions and none of the benefits to the deceased worker and assign one-half the tax contributions and *all* of the benefits to the surviving spouse. This procedure will obviously produce large and apparently capricious redistribution between

workers and their spouses, with high net transfers and internal rates of return for longer-lived spouses. The variance of returns would be enormous if Liebman had tabulated the actual benefit streams of people in his sample, since variations in mortality experience would lead to wide variation in lifetime benefits, but he instead tabulates individuals' expected benefit streams.

Unless I have overlooked something, however, a conceptual problem remains. The worker's contributions produce a set of benefit entitlements, some of which flow to the worker and some of which flow to the worker's surviving dependents. The expected benefits that go to a surviving dependent after the contributor has died do not appear as "returns" to the contributor, even though they are part of the entitlements that the contributor's taxes have purchased.

We could view contributions and benefits in a different way than does Liebman. All the benefits that flow from a Social Security earnings record, whether received by the contributor or his surviving dependents, could be assigned to that Social Security contributor. This alternative framework would certainly lift the measured internal rate of return on men's Social Security taxes and reduce the apparent return on women's taxes. I do not think this alternative procedure should be preferred to the one Liebman uses, but it is the framework implicitly used by many women's groups who criticize the antifemale bias of the Social Security system. They correctly point out that the current system does not give full credit to the OASDI contributions of working wives who are secondary family earners. On the margin, such earners receive little or no extra OASDI benefits for their contributions, because the family's main retirement and survivors' benefit will be determined by the earnings record of the higher-earning spouse. From this perspective, men's contributions are producing a higher rate of return than women's, exactly the opposite conclusion from the one reached in this chapter.

While I think that Liebman's procedure is sensible and informative, it should be clear that a different convention for assigning taxes and benefits would have produced sharply differing results. For many critics of Social Security (although not for me), the alternative convention seems more meaningful than the one adopted by Liebman.

Since Liebman emphasizes the perverse effect of spouse benefits on redistribution, I want to conclude with a brief discussion of those benefits. It seems to me that the architects of Social Security had in mind a society in which each family was mainly supported by one breadwinner and all men and women mated for life. They designed an old-age and survivors' program that attempted to offer "adequate" benefits at the least possible cost. Thus, they did not give large payments to the estates of contributors who died young, unless the deceased contributors left surviving dependents.

Social Security's architects obviously thought it cost 50 percent more to

support a couple than a single person.[1] A worker's premium contributions for Social Security thus purchased a pension that was 50 percent larger if two people survived or, equivalently, a pension 33 percent smaller if just one person survived. Suppose instead that the architects had chosen to give individual pensions without dependent spouse supplements. To assure that surviving couples had large enough pensions to support themselves comfortably, the basic pension would have had to be higher than the one provided to single survivors under the current system. The higher basic pensions in turn would have required a higher contribution rate. From the point of view of holding down program cost, a system with no dependent spouse benefit supplements would have provided "wastefully" high benefits to surviving single people. Given the rise in women's labor force participation and expected lifetime earnings, the original design of spouse benefits now seems misconceived and leads to capricious and sometimes regressive redistribution. Liebman suggests a sensible strategy for limiting the cost of spouse supplements and improving the redistributive impact of the system: Put a flat cap on dependent spouse monthly benefits.

It seems to me, however, that the design of spousal and survivor benefits provides real insurance to workers that Liebman's analysis may miss. He takes the perspective of people who have already survived to age sixty and know whether they will enter old age as a single person or as part of a married couple. At that point, workers' marital statuses already largely determine whether they will be advantaged or disadvantaged under the OAI and survivors' program. Women, especially secondary earner married women, can expect to receive large benefits relative to their contributions; men and single women can expect to be far less favorably treated. People who enter old age as single people are doomed to obtain the modest rate of return that their marital status automatically produces under Social Security.

However, at age sixteen or twenty this outcome could not have been foreseen, or it would have been just one of several possible outcomes. At that early age, the person would reasonably think he or she could marry, that the (unknown) marriage partner could earn substantially more or less than oneself, that the marriage partner could remain alive until old age. All of the possible benefit entitlements that flow out of these events would have entered into the individual's assessment of the expected returns ob-

1. In this they disagreed with the analysts who developed the official U.S. poverty thresholds. The poverty thresholds imply that it costs just 26 percent more to support an aged couple than an aged single person. This simple difference between the implicit equivalence scales in Social Security (and other benefit programs) and the poverty thresholds explains much of the difference in poverty rates between the elderly in married-couple and single-person households. Liebman does not make a family-size correction in computing the permanent incomes (AIMEs) of individuals included in his analysis. Thus, couples and single people with the same AIME are treated as having an equivalent position in the income distribution.

tainable under Social Security. What looks like a bad deal at age sixty-two, when a person enters old age without a living marriage partner, might have seemed like a much more attractive proposition at age twenty-two, when a happy marriage with a long-lived partner was still a real possibility.

An important question, then, is whether it is enough to analyze the distributional consequences of Social Security for people who have already experienced most of the marital status changes they will experience over their lifetimes. Or should we instead take the perspective of workers at, say, age sixteen, before the full sequence of marriage spells and widowhood is known? My guess is that a large number of well-informed sixteen-year-olds would find Social Security insurance valuable, even though at age sixty they will sensibly conclude it provided them with a bad deal—because they have no surviving spouse.

Let me emphasize, however, that I find Liebman's analytical framework and tabulations illuminating and helpful. Their limitations are those of all such tabulations: They provide just one kind of assessment of the redistribution produced by the system. A different framework would provide a different—although not necessarily a better—assessment.

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Discussion Summary

Laurence J. Kotlikoff questioned the large amount of dispersion in expected benefits for people with the same lifetime income. The author indicated that this dispersion is caused by a variety of factors including differential ex ante mortality, spousal benefits, and the timing of income.

Stephen Zeldes was concerned about the net present value calculations. Since the author used the average cohort rate of return instead of the significantly larger market-based rate of return to determine the net present value of benefits, Zeldes said there might be very different answers about the progressivity of the system if alternative rates of return were considered.

Because the marginal utility of income for the poor is so much higher than the marginal utility of income for the wealthy, *Jonathan Skinner*

thought the paper's conclusions might be completely different if the utility value of redistribution were analyzed, rather than just the dollar amount of redistribution. The author agreed with this assessment and noted that it might be important to take into account the value of insurance provision as well as weigh the dollar amounts of redistribution differently at various levels of the income distribution.

Several participants believed that the heterogeneous mortality experiences seen in historical data would not have as strong an impact in the future. However, the author said that it was not at all clear that mortality rates will converge in the future and pointed to actuarial forecasts implying a relatively constant gap between the life expectancies of men and women and to evidence from the 1960s to the mid-1980s indicating that over that period the morality experience of blacks and whites failed to converge.