Lifetime Distributional Effects of Social Security Retirement Benefits

Karen Smith and Eric Toder
The Urban Institute
and
Howard Iams
Social Security Administration

Prepared for the Third Annual Joint Conference for the Retirement Research Consortium
"Making Hard Choices About Retirement"
May 17-18, 2001
Washington, D.C.

The research report herein was performed pursuant to a grant from the U.S. Social Security Administration (SSA), to the Boston College Center for Retirement Research (CRR). The opinions and conclusions are solely those of the authors and should not be construed as representing the opinions or policy of SSA or any agency of the Federal Government or of the CRR. They also do not necessarily reflect the views of The Urban Institute, its Board or its Sponsors. The authors would like to acknowledge the outstanding research assistance of Jillian Berk.

Abstract

This paper presents alternative measures of actual and projected net benefits (benefits minus payroll taxes) from the Old and Survivor's Insurance (OASI) component of Social Security, based on results from a microsimulation model. The simulations take into account marital histories, income, and tax-burden sharing within couples and differences in life expectancy among sub-groups of the population. We find that OASI is becoming more redistributive towards lower income groups over time, even as net benefits decline, mostly because of changing demographics and earnings patterns of the workforce.

1. Introduction

Many people believe that the combination of payroll taxes and benefits of the Old Age and Survivors Insurance (OASI) portion of Social Security on balance redistributes income from higher income to lower income couples and individuals. The combination of a flat rate payroll tax and a benefit formula that replaces a higher share of earnings for workers with low lifetime earnings appears to provide a net redistribution to lower income groups.

The view that OASI redistributes income to the less well-off has been challenged, however, by recent research using longitudinal data sets. Gustman and Steinmeier (2000) note, for example, that the progressive benefit formula in OASI applies to earnings of *individuals*, not couples. Much of the apparent redistribution of OASI takes place within couples, with high-earning workers contributing to the benefits of their low-earning spouses. Most of the remaining redistribution is eliminated if one counts the potential earnings of nonworking spouses (who receive substantial benefits from OASI) in a measure of total lifetime earning capacity. Coronado, Fullerton, and Glass (2000) make these same adjustments and also incorporate mortality probabilities that differ by potential lifetime income. When they adjust for the longer life

spans of those with higher incomes, they find that the Social Security system is on balance regressive.

This paper provides new evidence on how OASI redistributes income among groups, based on simulations using the Model of Income in the Near Term (MINT), a microsimulation model developed at the Social Security Administration. We present alternative measures of actual and projected net benefits (benefits minus payroll taxes) from OASI for a sample of individuals in the 1931-60 birth cohorts. Our simulations take account of marital histories, income and tax-burden sharing within couples, and differences in life expectancy among subgroups of the population.

A main theme of the paper is how the effects of OASI on income distribution are changing over time, partly because of changes in tax rates and benefits, but more importantly because of changing demographics and earnings patterns of the workforce. Another main theme is the importance of considering the interactions of auxiliary benefits (spousal and survivor benefits) with changing individual circumstances (divorce, remarriage, widowhood) in determining the net effects of OASI on income distribution. Over time, the reduced importance of auxiliary benefits (due to higher lifetime earnings of women [Fullerton 1999; Hayghe 1990, 1993, 1997; Wetzel 1990] and the increase in the proportion of retirees who are divorced [Clarke 1995]) makes OASI more progressive for future cohorts than for cohorts who retired in the 1990s, even as the net benefit from OASI declines (Social Security Administration 2001).

2. Analyzing the Effects of OASI on Income Distribution

Overview

It is meaningful to examine how OASI taxes and benefits redistribute income only in comparison to some assumption of what fiscal policy might be in the absence of OASI. One common alternative assumption (either implicit or explicit in other studies) is that the taxes contributed to OASI would otherwise go to an individual account that earns a market rate of return and provides retirement benefits only to the worker who contributes to it and to his or her

spouse. This is the counterfactual we use in this paper to measure how OASI alters income distribution. We consider two separate alternatives for this counterfactual. In the first alternative, it is assumed that individuals use the proceeds of the investment any way they wish – either to purchase an (actuarially fair) annuity or to self-insure against the risk of outliving their assets. In the second alternative, it is assumed that they are required to use the wealth accumulated at retirement age to purchase a unisex annuity based only on average life expectancy by age and cohort.[1]

How OASI Redistributes Income

The extent of redistribution by Social Security reflects the balance between lifetime taxes paid and benefits received by different subgroups. In order to understand how Social Security affects income distribution, one must examine OASI program rules (Social Security Administration 2001). OASI provides benefits for retired workers, spouses of retired workers, and surviving spouses (widows/ers). Retired-worker benefits are computed by indexing annual earnings over a person's working life of 35 years and then calculating average indexed monthly earnings (AIME) and the primary insurance amount (PIA) – the benefit payable at the normal retirement age, currently 65. Persons with 40 or more quarters of coverage over their work lives are fully insured and receive retired-worker benefits. Because the PIA formula pays benefits at a higher rate for lower lifetime earnings levels, it redistributes income from high-wage to low-wage workers. Some of this redistribution occurs within couples, however, thereby allowing high-wage workers to benefit from the high replacement rate that their low-wage spouses receive.

[1] The findings of this paper do not indicate the net effects of replacing OASI in whole or in part with individual accounts because they do not account for costs of transition to a new system. Instead, the results should be interpreted as showing how the OASI benefit formula affects subgroups within each cohort compared with how they would fare if their retirement benefits were based on the accrued value of the taxes they paid.

A focus on individual earned benefits alone is a simplification, however, because aged persons without 40 quarters of coverage can still receive benefits through marriage. OASI provides auxiliary benefits to aged spouses and to surviving spouses of insured workers who are age-eligible for benefits. An aged person can be eligible for half of a divorced spouse's benefit and to all of a deceased spouse's benefit, reduced for early retirement. Because entitlement to these auxiliary benefits occurs without additional taxes from insured workers, their impact on the net redistribution across income groups from Social Security benefits is unclear.[2]

Why OASI Benefits Will Become More Progressive Over Time

We believe that the net redistribution of the OASI tax/benefit structure will become more favorable to low-income groups over time because of shifting demographics and earnings patterns in the last half of the twentieth century. The OASI benefit structure is a function of a person's lifetime earnings, a person's marital history, and his/her current and former spouse's lifetime earnings. Major changes in the lifetime earnings of recent cohorts of women combined with dramatic shifts in marital histories have increased the likelihood of women receiving earned-OASI benefits (Butrica, Iams, and Sandell 1999; Butrica, and Iams 1999, 2000a, and 2000b; Iams and Sandell 1997). For example, while a majority of wives in the depression cohort should receive auxiliary OASI benefits as wives, the majority in the late baby boom cohort should receive only their own earned benefits (Butrica, Iams, and Sandell 1999).

Although Gustman and Steinmeier (2000) and Coronado et al. (2000) study intact married couples, OASI also provides auxiliary benefits to divorced persons with 10 years of marriage to an insured worker who is age-eligible for benefits. Divorced spouse and surviving

[2] OASI technically can pay earned retired-worker and auxiliary benefits to a person "dually" entitled to both benefits, but the payment is limited to the larger of the two benefits. Because their lifetime earnings are lower on average than their husbands' earnings, many women with earned retired-worker benefits receive higher benefits as spouses and surviving spouses than they receive as retired workers. SSA calculates an earned retired-worker benefit and pays a supplement equal to the difference between the earned retired-worker's benefit and the full spouse's or surviving spouse's benefit to which the person is entitled.

divorced spouse benefits are based on the earnings history of the ex-husband or dead ex-husband with the highest PIA. A woman is entitled to a divorced spouse benefit that is essentially equal to one-half of the ex-husband's PIA. Once her ex-husband dies, she is entitled to a surviving divorced spouse benefit that is essentially equal to the dead ex-husband's full PIA, unless it is reduced for early retirement. A divorced woman, however, receives no auxiliary benefits if her marriage lasted fewer than 10 years. With divorce rates increasing, a higher share of more recent birth cohorts will be divorced in retirement and many aged divorced women are economically vulnerable (Butrica and Iams 2000a). These divorced women will be reliant on their own earnings histories, and thus will benefit from the relatively high replacement rate that OASI provides to workers with low lifetime earnings.

Thus, recent changes in both lifetime earnings of women and marital histories should make OASI more progressive. Increasing earnings of women, especially married women, means that much less of the high replacement rates for low earners will benefit high-earning couples. Increased divorce rates means that a much larger share of spouse and survivor benefits will go to divorced women with low lifetime earnings.

Using the Model of Income in the Near Term (MINT) to Analyze How OASI Affects Income Distribution

The Social Security Administration's Office of Research, Evaluation, and Statistics developed the Model of Income in the Near Term (MINT) with substantial assistance from the Brookings Institution, the RAND Corporation, and the Urban Institute. (See Butrica, Iams, Moore, and Waid 2001; Panis and Lillard 1999; and Toder et al. 1999). The MINT data system projects the economic resources of current and future aged beneficiaries from retirement through death. MINT makes independent projections of each person's marital changes, mortality, and major sources of retirement income (Social Security benefits, pensions, assets, age of first benefit receipt, and earnings of working beneficiaries). The base MINT data file is

the Census Bureau's Survey of Income and Program Participation (SIPP) 1990-1993 panels, matched to SSA administrative records for persons born in 1926 through 1965.

The MINT data system projects future marital histories and estimates characteristics of future and former spouses. Many in MINT are exactly matched to their spouse through the 1990-1993 SIPP survey, because they remain married until retirement age. MINT estimated marital transitions from the reported marital histories of up to three marriages in the 1990-1991 SIPP panels, using gender-specific continuous time hazard models for marriage and divorce. The predictors were age, education, number of years unmarried, whether widowed or not, and calendar year after 1980. The last variable reflects the stabilization of divorce rates at a relatively high level in the early 1980s (Goldstein 1999). A validity test of the models provided a good fit with the marital histories for the 1992-1993 SIPP panels. MINT also imputed the characteristics of former and future spouses and used these imputed characteristics to establish a donor from MINT observations. The former or future spouse was statistically assigned from a MINT observation with similar characteristics, or a "nearest neighbor. Thus, the MINT data system contains observed and estimated marital histories with linkage to the characteristics of current, former, and future spouses necessary for Social Security benefit estimates.

The earnings projections for this analysis differ from the original MINT data system (MINT1). MINT1 based Social Security benefits on Social Security qualifying earnings through age 67. Earnings were the person's own SSA-recorded earnings from 1951 through 1996 and were projected for years after 1997 with fixed-effects models of age-earnings patterns by gender and education level. In order to increase variability in projections, the revised version of the model (MINT2) projects earnings from 1999 through age 67 using a "nearest-neighbor" matching procedure. (MINT2 uses the person's own SSA-recorded earnings from 1951 through 1998.) The nearest-neighbor procedure statistically assigns to each "recipient" worker five years of actual annual earnings from a "donor" MINT observation born five years earlier with similar characteristics. The splicing of five-year blocks of earnings from donors to recipients continues until earnings projections reach age 67. The "nearest neighbor"

match links the MINT donor with a recipient in the same age interval, based on a number of matching characteristics. These match criteria include gender, minority group status, education, disabled worker entitlement, average earnings in the last five-year period, presence of earnings in the fourth and fifth year of the five-year period, and age-gender group quintile of average pre-match period earnings. Because it does not use regression estimates of average age-earnings patterns, the MINT2 projection increases the variability in projected earnings patterns, compared with the fixed-effects procedure in MINT1.

MINT also projects death dates, which influences the balance of lifetime benefits. MINT2 projects deaths until age 65 through the nearest neighbor matching procedure previously discussed for matching lifetime earnings. If the donor died in the period following the matched age interval, the matched recipient also died in his or her imputed age interval. The procedure adjusts total deaths by age and cohort through age 65 to fit projections of the SSA Office of the Chief Actuary. The expected death date after age 65 in MINT2 reflects a continuous time hazard model using the 1968-1994 Panel Study of Income Dynamics or PSID (Panis and Lillard 1999), adjusted for differential mortality rates between those who were or were not former DI benefit recipients. (Zayatz 1999) The model considered race, education, marital status, permanent income, calendar time, and age group (age 30-64, or age 65 and older). The PSID death rates were adjusted to represent the United States National Vital Statistics rates. This model procedure is consistent with recent evidence of mortality compression and deceleration (Lynch and Brown 2001).

While the MINT data system includes information on individuals born between 1926 and 1965, the policy universe for retirement income estimates is the surviving population born from 1931 through 1960 that is expected to receive Social Security retirement and survivor benefits. MINT2 also projects disability status, earnings of disabled workers, and disability benefits; but the analyses in this article exclude Social Security disability recipients.

Other recent studies of the effects of Social Security on income distribution have also used detailed longitudinal data files, including the Health and Retirement Study, the Panel Study on Income Dynamics, and a matched data file of the 1990-91 Survey of Income and Participation with Social Security Administrative records. MINT provides a richer and more complete data file along several dimensions for estimating the effects of OASI:

- It measures and projects years of marriage to determine if the ten-year requirement is met for receiving benefits as a divorced (or widowed) ex-spouse;
- It estimates lifetime earnings of former and future spouses;
- It projects the level of retirement benefits earned from observed Social Security records of earnings through 1998 and from projected earnings until expected retirement;
- It projects mortality rates of retirees, based on their demographic characteristics; and
- It allows for the comparison of the life histories (earnings patterns, marriages, divorces, date of death) of different birth cohorts.

3. Overall Approach of Study

Measuring how OASI affects income distribution requires a number of methodological choices. The key choices are: (1) what measure or measures to use to classify people's economic status, (2) how to measure taxes paid, (3) how to measure benefits received, and (4) how to display the effects of OASI on income distribution.

Classifying People

In this study, the basic unit of observation is the individual. We take account of marriage by assuming that married individuals evenly divide the total income and tax burden of the couple.

We use three broad measures of economic status. First, we rank people by their present value of lifetime earnings. Second, we rank people by their present value of *shared* lifetime earnings. We compute shared earnings by assigning each individual half the total earnings of the individual and his/her spouse in the years when he/she is married, plus his/her own earnings when he/she was single. Third, we rank individuals by permanent income at age 62. Permanent income includes earnings, Social Security retirement benefits, income from defined benefit pension plans after age 62, and the annual payments from an actuarially fair joint and survivor annuity from wealth (excluding defined benefit pension and Social Security wealth) at age 62. Permanent income is the level annual income amount that produces the same present value of income (at age 62) as the individual's actual projected income stream until his/her projected date of death.[3] We also classify people by gender, marital status, race, and level of education.

Ranking people by permanent income instead of the present value of lifetime earnings provides an alternative way of measuring economic status. With a lifetime earnings measure, two people who work until the same age and have the same earnings history are treated as having the same economic status. This makes sense as a measure of total resources available to a person over his or her lifetime. But an individual with a longer life expectancy cannot support as high an annual living standard as can a person with the same present value of earnings but a shorter life expectancy. One of the goals of Social Security is to maintain living standards during retirement for those who would otherwise spend down their savings. Thus, it makes sense to consider an alternative measure – the permanent income measure – that classifies people by their potential annual living standard when they become age-eligible for Social Security early retirement benefits.

[3] In making this calculation, we assign each married individual half the total income of the couple in years they are married and their own income in years they are single. Spousal and survivor benefits received by divorced spouses are all attributed to the recipient.

Measuring Taxes Paid

When we classify people by their present lifetime value of earnings, we measure taxes as the present value of OASI payroll taxes.[4] We use the present value of taxes paid on the worker's earnings when we classify people by their individual lifetime earnings. We use the present value of shared taxes when we classify people by shared lifetime earnings. To compute shared taxes, we assume each married person pays half the total payroll taxes paid by the couple in the years they are married.

When we classify people by permanent retirement income, we measure the tax burden as the foregone permanent retirement income that occurs because payroll taxes were contributed to the OASI trust fund instead of being saved by the individual and accrued at the market rate of interest.[5] Thus, the tax burden is the foregone income from the wealth that the individual would otherwise have accrued. We calculate foregone permanent income in two ways. In one method, we calculate the annual permanent income (until death) that the wealth could have produced given the individual's actual life span.[6] In the other calculation, we work out the annual permanent income that the wealth would have produced if the individual had been required to purchase a unisex joint and survivor annuity. Using these two measures of foregone retirement benefits, we can calculate the portion of the redistribution from OASI that results from the structure of the benefit formula (including worker and auxiliary benefits) and the portion of the redistribution that occurs because the annual benefit does not vary with life expectancy.

Measuring Net Benefits

---

[4] We count both the employer and employee shares of payroll taxes, on the assumption that the worker bears the economic burden of both.

[5] In the calculations in this paper, we assume a real discount rate of 2.7 percent. We have not performed sensitivity tests to examine how the discount rate assumption affects the results.

When we classify people by their present value of earnings, we measure the net benefit as the present value of OASI benefits. OASI benefits are the benefits received by the individual, when we classify people by individual earnings, and half the benefits received by a couple (in years an individual is married), when we classify people by shared earnings.

When we classify people by their permanent income, we calculate the level of real OASI benefit that produces the same present value as the stream of future benefits people receive. For individuals who are unmarried at age 62 and remain single until death, the real OASI benefit is the same every year after initial benefit receipt. For individuals who are married, however, annual benefits will typically change after the death of a spouse. (For people who receive benefits beginning after age 62, the annual benefit amount is discounted to reflect the delay in starting benefits.)

A special problem was posed by couples of different ages, so that one spouse (typically the husband) receives benefits before the other spouse is age-eligible. Because we are interested in measuring the permanent income and benefits of people from age 62 onward in these calculations, we do not count the wife's share of Social Security benefits her husband receives before she reaches age 62 as part of her income or benefits. Instead, we only count income she receives beginning at age 62.[7] We also do not count widows' benefits received at ages 60 and 61. Thus, an individual's relative level of permanent benefits received in retirement can in some cases differ substantially from the measure of her present value of benefits, which counts all the Social Security benefits (individual and shared) that she receives over her lifetime. In particular, the permanent income measure of benefits can be very low relative to the present value measure of benefits for women who have much older spouses and a short life span after age 62.

[6] For couples, this is based on a joint and survivor annuity of the couple's wealth from age 62 until projected death dates of both the husband and wife. Each partner receives half of this income.
[7] We do the same for a husband when he is the younger spouse.

Displaying Results

In the tables that report the effects of OASI on the present value of lifetime income, we rank individuals in each five-year birth cohort group (1931-35 through 1956-60) by quintile of present value of earnings and display the present values of lifetime earnings, taxes, worker benefits, spousal benefits, survivor benefits, and net benefits (benefits minus taxes). To facilitate comparisons among cohorts with different earnings levels, we also display the present values of taxes and benefits as a share of the present value of earnings.

In the tables that show the effects of OASI on permanent retirement income, we rank individuals in each five-year birth cohort group by quintile of permanent retirement income. We show the annual value of worker benefits, spousal benefits, and survivor benefits and compare that sum to two measures of foregone benefits that could be purchased if payroll taxes were invested at a market rate of return and used to purchase a retirement annuity. The first measure of foregone benefits assumes that the individual must purchase a unisex annuity at the cohort-specific average life expectancy. The second measure of foregone benefit assumes the individual consumes his or her accrued wealth at an equal annual rate until his or her projected year of death.

We also show the distribution of OASI benefits by education, race, and gender. We display these results for both the present value measures and the permanent income measures.

4. Results of Simulations

When individuals are ranked by their lifetime present value of own earnings, OASI, as expected, is very redistributive. (tables 1a-1c, figure 1a-1c). For the 1931-35 birth cohorts, OASI provides net benefits to the bottom four quintiles and especially large net benefits to the lowest quintile. Workers in the lowest quintile receive benefits equal (in present value) to almost 1½ times their lifetime income, while they pay taxes of less than 8 percent of lifetime income.

Only 7 percent of the benefits in the bottom quintile come from own earnings of workers – the remainder are either spousal benefits or survivor benefits. In contrast, almost 100 percent of benefits in the top quintile are worker benefits. The redistribution from the highest to lowest quintile remains substantial for the 1956-60 birth cohorts, but the degree of redistribution declines over time. In the 1956-60 cohorts, the lowest quintile of workers is projected to receive far less in spousal and survivor benefits per dollar of own lifetime earnings than the earlier cohorts. They still get substantial net benefits, however, both because they receive a very high replacement rate as workers and because, compared with other quintiles of earners, the spousal and survivor benefits they receive are relatively large.

As expected, the redistribution from high to low earners that OASI is estimated to produce is much less dramatic when workers are classified by their lifetime present value of shared earnings instead of individual earnings (tables 2a-2c, figure 2a-2c).[8] Auxiliary benefits remain a large share of benefits for workers with low shared lifetime earnings, reflecting the fact that many of these workers are women who receive spousal and survivor benefits, but have lower earnings than their spouses in years they were not married. For the 1931-35 cohorts, all worker groups receive positive net benefits (i.e., benefits less payroll taxes) from OASI, but the net benefit as a percentage of lifetime earnings is highest in the bottom quintile (almost 12 percent) and lowest in the top quintile (just over 1 percent). For the 1956-60 cohorts, net benefits in the bottom quintile are also 12 percent, but net benefits in all other quintiles are less than for the 1931-35 cohorts, and net benefits are negative in the top quintile. Net benefits decline between 1931-35 and 1956-60 for successive cohorts in every quintile except the bottom quintile. (table 2c). The result is that OASI is becoming less generous, but also more progressive, over time.

[8] It may appear counter-intuitive that the aggregate taxes and benefits from OASI that we display also differ slightly between tables 1a-1c and tables 2a-2c. The reason for the difference is that the shared earnings measure (in tables 2a-2c) includes earnings shared with an imputed spouse who may not be in the MINT2 sample, while the earnings in tables 1a-1c are earnings only for workers in the MINT sample. Thus, the overall universe for counting earnings differs between the two tables.

One reason OASI is becoming more progressive for workers ranked by shared earnings is the increased importance of worker benefits relative to auxiliary benefits. The rise in worker benefits as a share of all benefits reflects the increase over time in the relative lifetime earnings of women. This rise in lifetime earnings increases both the worker benefits women receive and the OASI taxes women pay. It also reduces both their spousal benefits and survivor benefits. The share of benefits accounted for by own worker benefits increases between the 1931-35 and 1956-60 birth cohorts in all quintiles of the income distribution; overall, it is projected to increase from 75 percent of benefits for workers born in 1931-35 to 87 percent of benefits from workers born in 1956-60.

The shorter life expectancy of low-earning workers compared with high-earning workers should, by itself, reduce their relative net benefit from OASI. Even so, however, the benefit formula is so favorable to them that lower-earning workers, even with the shared earnings measure, receive a better deal over their lifetime from OASI than higher-earnings workers.

When individuals are ranked by permanent income at age 62 and only income from age 62 on is counted, however, the story is quite different (tables 3a-3c, figure 3a-3c). For example, for the 1931-35 birth cohorts, net benefits from OASI decline from 19 percent of income to just over 3 percent of income as income rises between the second quintile and the top quintile (table 3a). But net benefits from OASI are negative in the bottom quintile and large, amounting to *negative* 18 percent of income.

The main reason that OASI hurts retirees in the bottom quintile of income is their relatively short life expectancy. The column labeled "Adjusted Annuity" in tables 3a and 3b shows what individuals in each quintile would have received each year if they had invested their payroll taxes and then spent down their wealth to zero by their projected age of death. In the 1931-35 birth cohorts, the lowest quintile could have on average received an expected annual benefit from age 62 until death from investing their payroll taxes amounting to almost 80 percent

of their permanent retirement income.[9] In contrast, purchasing a unisex annuity with the same savings would have yielded them an annual benefit of only 50 percent of their retirement income OASI provides them with higher net benefits relative to a unisex annuity (61 percent asopposed to 50 percent), reflecting the high OASI replacement rate for low earners (presumably mostly the same people as low-income retirees). But the requirement to purchase an annuity that does not reflect their shorter life expectancy reduces their annual benefits by about 30 percent of total retirement income.

The story is similar for the 1956-60 birth cohorts (table 3b) except that, for these groups, net benefits also turn negative for individuals in the top two quintiles of the income distribution. On average, net retirement income for the 1956-60 birth cohorts from OASI is less than the net income that an actuarially fair annuity purchased with the proceeds of invested payroll taxes would produce. Note, however, that this measure of net retirement income does not include all the benefits from OASI; it excludes benefits that widowed and married individuals receive (either survivor benefits or their share of worker benefits received by their spouse) before they reach age 62.

Net benefits from OASI also vary by education level, race, and gender. The net present value of OASI benefits relative to lifetime earnings is higher for less educated than more educated workers; higher for Hispanics and African Americans than for white non-Hispanics, and much higher for females than for males (tables 4a-c, figure 4a-4c). The percentage of OASI benefits coming from own worker instead of auxiliary benefits also differs among groups. Own-worker benefits are relatively more important for more highly educated than less-educated workers and for males than females. The proportion of benefits from own-worker benefits does not vary much, however, among racial groups.

[9] Note that individuals cannot actually purchase an annuity that yields this benefit flow in today's market. The column labeled "Adjusted Annuity" in table 3 shows the expected annual retirement benefit for a given life span if payroll taxes were invested and then the proceeds were used to finance level benefits until death. But this figure does not reflect any utility loss associated with the risk of outliving one's assets.

The present value of net benefits from OASI relative to lifetime earnings has declined for each successive group of cohorts between 1931-35 and 1956-60 for all education/race/gender groups. While it is declining for all groups, it remains positive for all education and racial groups in the more recent birth cohorts, but is negative for males as a group.

When distribution is measured by the ratio of net annual benefits from OASI after age 62 to permanent income in retirement, OASI still redistributes income from more- to less-educated individuals and from males to females (tables 5a-c, figure 5a-5c). But, in contrast to the present value measure, the permanent income at age 62 measures show that African Americans do less well under OASI than white non-Hispanics, especially in the 1956-60 birth cohorts. Net annual benefits in retirement from OASI as a percentage of permanent retirement income are declining over time for all education and racial groups and for both males and females. For more recent birth cohorts, net benefits turn negative for more educated individuals (all education groups except high school dropouts), both white non-Hispanics and African Americans, and for males as a whole (table 5c).

5. Conclusions

This paper presents alternative measures of the distribution of actual and projected net benefits (benefits minus payroll taxes) from Social Security's Old Age and Survivor's Insurance (OASI) for individuals born between 1931 and 1960. The results are based on simulations with the Model of Income in the Near Term (MINT), a simulation model developed at the SSA that projects retirement income through the year 2020. The base sample for MINT is the U.S. Census Department's Survey of Income and Program Participation (SIPP) panels for years 1990-93, matched with the Social Security Administration's records.

We use three alternative measures to rank people into economic status groups and compute lifetime benefits and taxes. First, we rank people by quintiles of individual lifetime earnings and measure their lifetime present values of OASI benefits received and payroll taxes

paid. Using this measure, we find that OASI provides much higher benefits to the lowest quintile of earners than to other groups, but becomes less redistributive towards lower lifetime earnings groups in more recent birth cohorts. Second, we rank people by a measure of shared lifetime earnings and compute values of shared benefits received and taxes paid. In this measure, individuals are assumed to equally split earnings, benefits, and taxes with their spouses in the years they are married. With the shared earnings measure, OASI is still much more favorable to lower than to higher income quintiles, but by a lesser degree than when people are ranked by individual earnings. But OASI becomes more progressive among more recent cohorts even as net lifetime benefits decline for the population as a whole. While the lowest quintile receives a relatively constant percentage of net benefits relative to lifetime earnings over time, the higher quintiles of lifetime earners receive lower net lifetime benefits relative to lifetime earnings in later cohorts.

In the final measure, we rank individuals by their permanent income from the age they become eligible for early retirement benefits (at age 62) until death. We compare the annual Social Security benefits they receive with the benefits they could have received if they had saved their payroll taxes in individual accounts and used the proceeds to finance a level flow of payments from age 62 until death. We use two alternative measures of these "forgone benefits". The first is the expected annual benefit they could finance, given their projected life span. The second is the annual benefit they would receive if they were required to use the account proceeds to purchase a unisex annuity based on the life expectancy of their entire cohort.

Using this final set of measures of income, benefits, and tax burdens, we find that OASI is relatively more favorable to people in higher than in lower permanent income quintiles, with the exception of people in the lowest income quintile. Individuals in the lowest income quintile would receive larger expected benefits in retirement if they invested their payroll taxes than under OASI because they receive OASI benefits over a relatively short remaining life span. However, OASI is more favorable to them than a system that required them to use the

proceeds of their invested payroll taxes to purchase a unisex annuity. As with the shared earnings measure, OASI is becoming more progressive over time as the relative net benefits it provides decrease more rapidly among higher than among lower income quintiles.

We also examine how OASI affects individuals grouped by levels of educational attainment, race, and gender. In general, using both lifetime earnings and permanent income measures, OASI is shown to be relatively more favorable to less-educated than to more educated workers and more favorable to women than to men. The results by race are mixed. When people are ranked by their present value of lifetime earnings, OASI is shown to be more favorable to African Americans and Hispanics than to white non-Hispanics. When people are ranked by their permanent income in retirement, however, OASI is shown to produce negative returns for both African Americans and white non-Hispanics in the most recent birth cohorts, with African Americans faring relatively worse than whites.

The cohort changes occur partly because of changes in tax rates and benefits, but more importantly because of changing demographics and earnings patterns of the work force. Of particular importance is the extent that OASI benefits are earned or come from auxiliary benefits as spouses or survivors. The importance of auxiliary benefits (spousal and survivor benefits) interacts with marital histories (divorce, remarriage, widowhood) in determining the net effects of OASI on income distribution. Among more recent cohorts, the reduced importance of auxiliary benefits (due to higher lifetime earnings of women) and the increase in the proportion of retirees who are divorced makes OASI more progressive than for cohorts who retired in the 1990s, even as the net benefit from OASI declines.

The data underlying these results are from a simulation model, MINT, that takes account of lifetime OASI earnings, marital histories, age of Social Security take-up, and differences in life expectancy among subgroups of the population. MINT combines detailed data on demographic characteristics, income, and earnings histories from Census samples and administrative data with projections of future trajectories of earnings, wealth accumulation, and

life events (marriage, divorce, and mortality). These projections apply statistical relationships estimated from earlier cohorts to project future outcomes for later birth cohorts with very different early life histories. While we believe these projections are reasonable, we must emphasize that they are still only projections. MINT is still under development, with new and revised modules for retirement behavior, wealth accumulation and spend-down (among retirees), pension wealth and benefits, and SSI benefits and living arrangements being added to the model. In addition, there will be more testing to validate the reasonableness of the model's projections. Thus, while the results in this paper are informative about trends in the effects of OASI on income distribution, further model development may alter some of the conclusions.

References

Butrica, Barbara A. and Howard M. Iams. 2000a. "Divorced Women at Retirement: Projections of Economic Well-Being in the Near Future." *Social Security Bulletin* 63 (3).

———. 2000b "Never Married Women Reaching Retirement: A Case of Economic Vulnerability." Paper presented at the Annual Meetings of the American Sociological Association. Washington, D.C.

———. 1999. "Projecting Retirement Income of Future Retirees with Panel Data: Results from the Modeling Income in the Near Term (MINT) Project." *Social Security Bulletin* 62 (4): 3-8.

Butrica, Barbara A., Howard M. Iams, James H. Moore, and Mikki Waid. 2001. "Methods in Modeling Income in the Near Term (MINT)." ORES Working Paper No. 93.: Social Security Administration Office of Policy, Washington, D.C.

Clarke, Sally C. 1995. "Advance Report of Final Divorce Statistics, 1989 and 1990." *Monthly Vital Statistics Report* 43(9), Supplement (March). National Center for Health Statistics.

Coronado, Julia Lynn, Don Fullerton, and Thomas Glass. 2000. "The Progressivity of Social Security." NBER Working Paper No. 7520. February.

Fullerton, Howard N. Jr. 1999. "Labor Force Participation: 75 Years of Change, 1950-98 and 1998-2025." *Monthly Labor Review,* December.

Goldstein, Joshua R. 1999. "The Leveling of Divorce in the United States." *Demography* 36 (3): 409-414.

Gustman, Alan L. and Thomas L. Steinmeier. 2000. "How Effective is Redistribution Under the Social Security Benefit Formula?" Presented at Second Annual Joint Conference for the Retirement Research Consortium, Washington, D.C., May 17-18.D.C..

Hayghe, Howard V. 1997. "Developments in Women's Labor Force Participation." *Monthly Labor Review*. September: 41-46.

———. 1993. "Working Wives' Contributions to Family Incomes." *Monthly Labor Review*. August: 39-43.

———. 1990. "Family Members in the Work Force." *Monthly Labor Review*. March: 14-19.

Iams, Howard M. and Steven H. Sandell. 1997. "Projecting Social Security Earnings: Past is Prologue." *Social Security Bulletin* 60 (2): 3-16.

Lynch, Scott M. and J. Scott Brown. 2001. "Reconsidering Mortality Compression and Deceleration: An Alternative Model of Mortality Rates." *Demography* 38 (1): 79-97.

Panis, Constantijn, and Lee Lillard. 1999. "Near Term Model Development." Final Report. Contract No. 600-96-27335. Santa Monica, Calif.: RAND.

Social Security Administration. 2001. "Social Security Handbook: Your Basic Guide to the Social Security Programs." SSA Publication No. 65-008, 14th Edition.

Toder, Eric, Cori Uccello, John O'Hare, Melissa Favreault, Caroline Ratcliffe, Karen Smith, Gary Burtless, and Barry Bosworth. 1999. "Modeling Income in the Near Term-Projections of Retirement Income Through 2020 for the 1931-1960 Birth Cohorts Final Report." SSA Contract No. 600-96-27332. Washington, D.C.: The Urban Institute and the Brookings Institution.

Wetzel, James R. 1990. "American Families: 75 Years of Change." *Monthly Labor Review*. March: 4-13.

Zayatz, Tim. 1999. "Social Security Disability Insurance Program Worker Experience." Actuarial Study No. 114. June. Baltimore, Md.: Office of the Chief Actuary of the Social Security Administration.

Figure 1a-b
Present Value of Individual OASI Taxes and Benefits
as a Percent of Individual Lifetime Earnings
By Individual Lifetime Earnings Quintile

Figure 1c
OASI Net Benefits as a Percent of Individual Lifetime Earnings
by Birth Cohort for the Bottom, Middle, and Top Individual Earnings Quintile

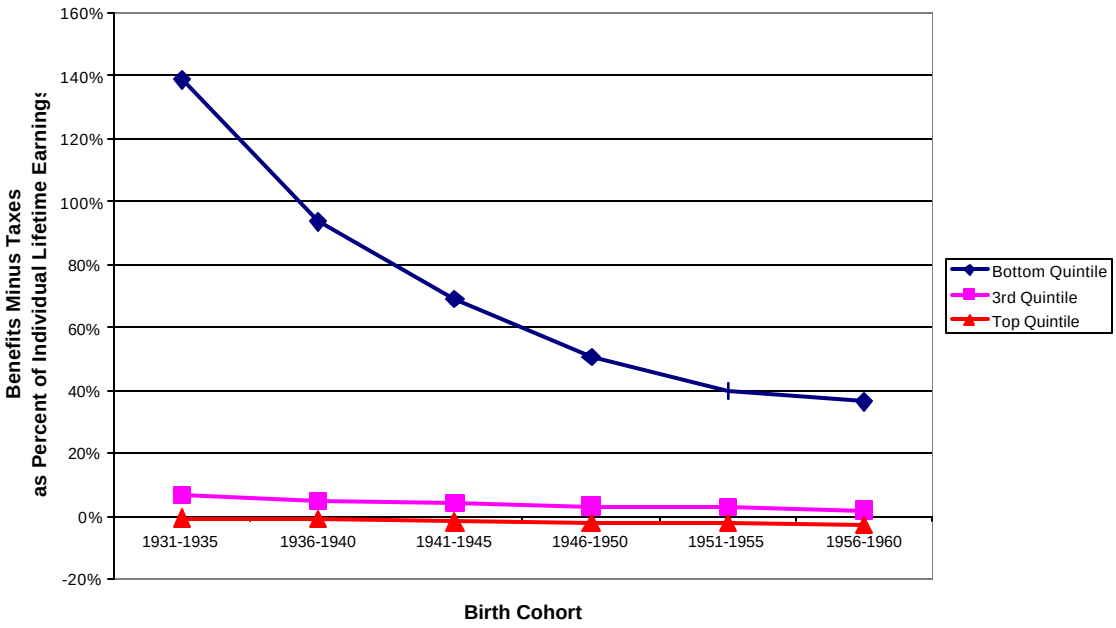
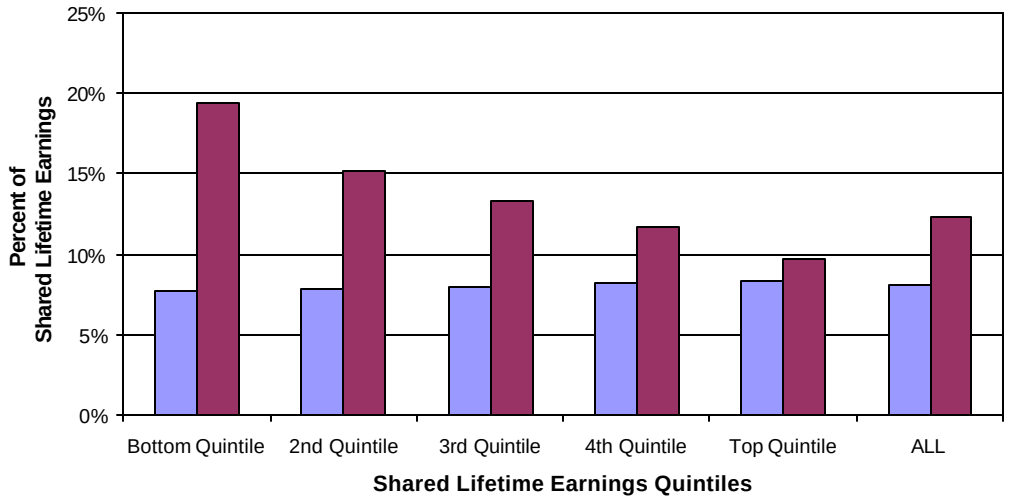


Figure 2a-b
Present Value of Shared OASI Taxes and Benefits
as a Percent of Shared Lifetime Earnings
By Shared Lifetime Earnings Quintile

1931-1935 Birth Cohorts



1956-1960 Birth Cohorts

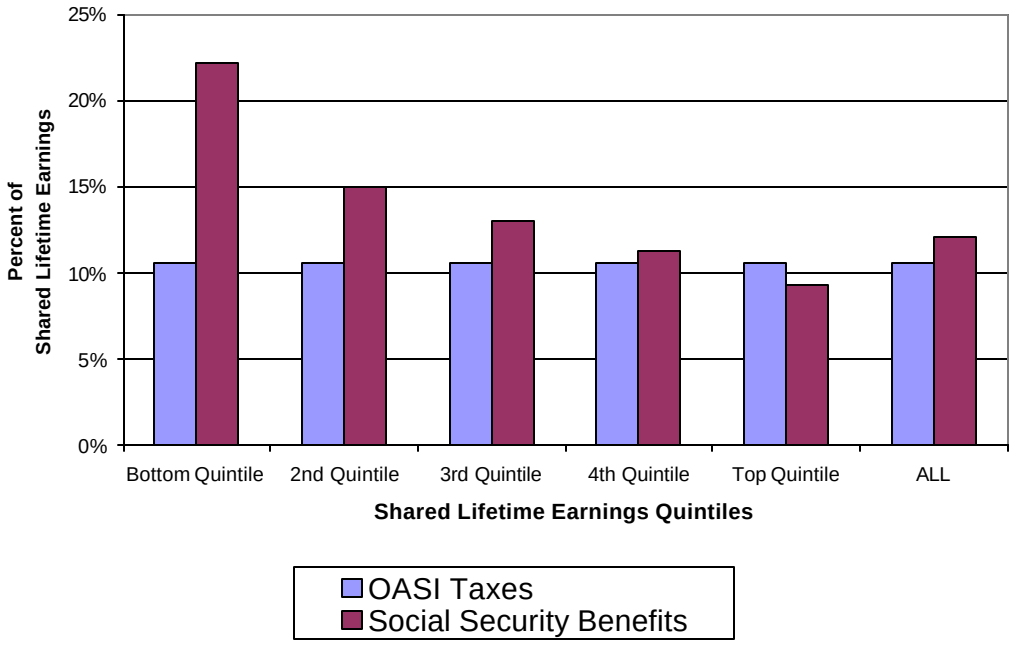


Figure 2c
OASI Net Benefits as a Percent of Shared Lifetime Earnings
by Birth Cohort for the Bottom, Middle, and Top Shared Earnings Quintile

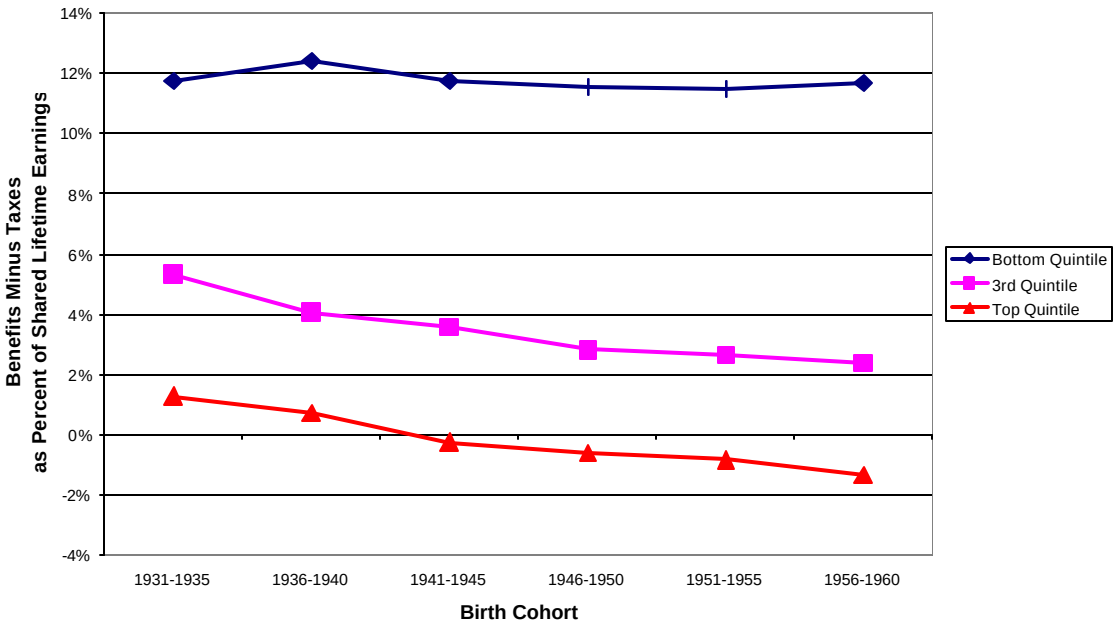


Figure 3a-b
Benefits and Forgone Benefits
as a Percent of Permanent Income
By Permanent Income Quintile

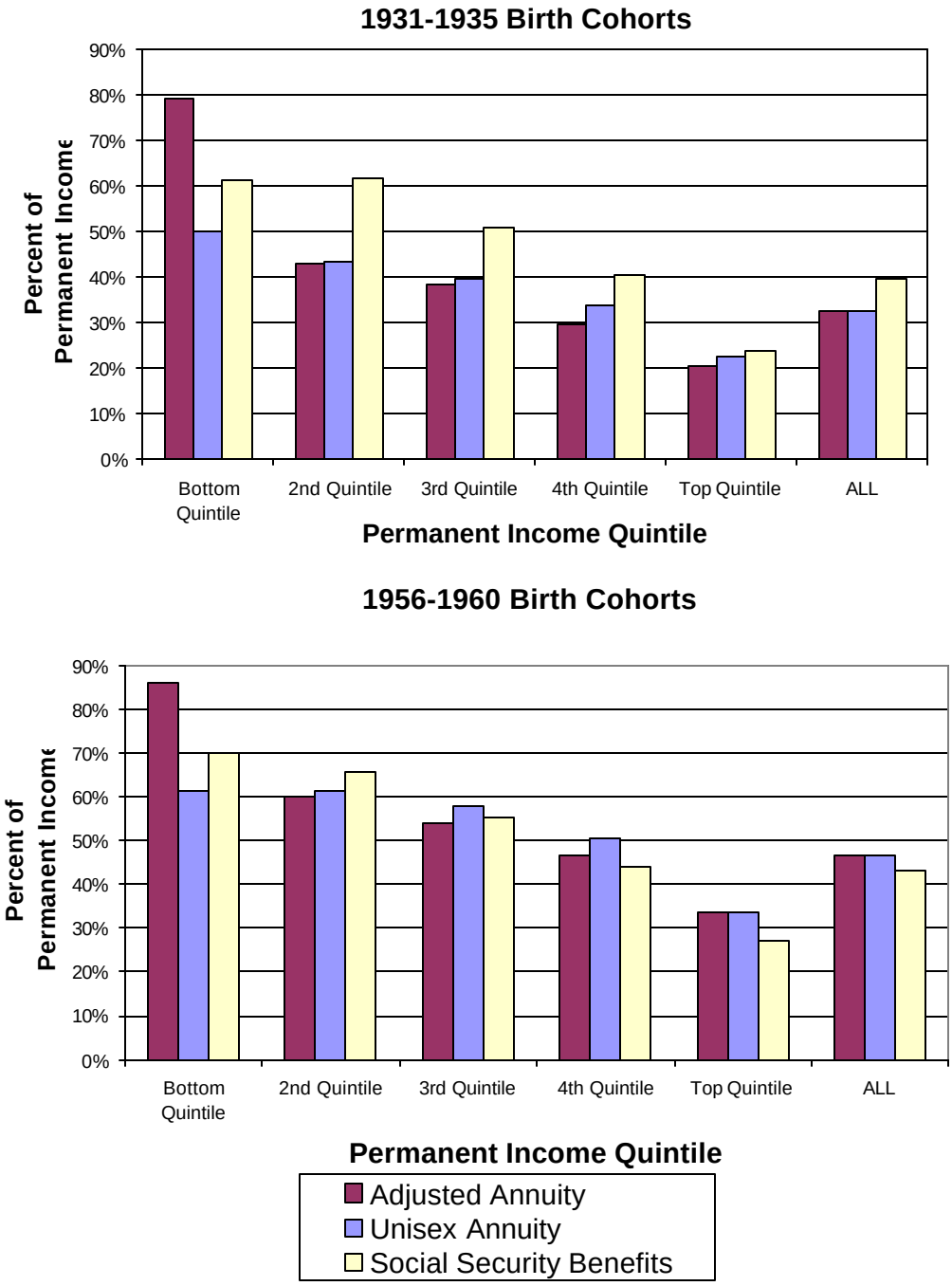


Figure 3c
Benefits and Foregone OASI as a Percent of Permanent Income
by Birth Cohort for the Bottom, Middle, and Top Permanent Income Quintile

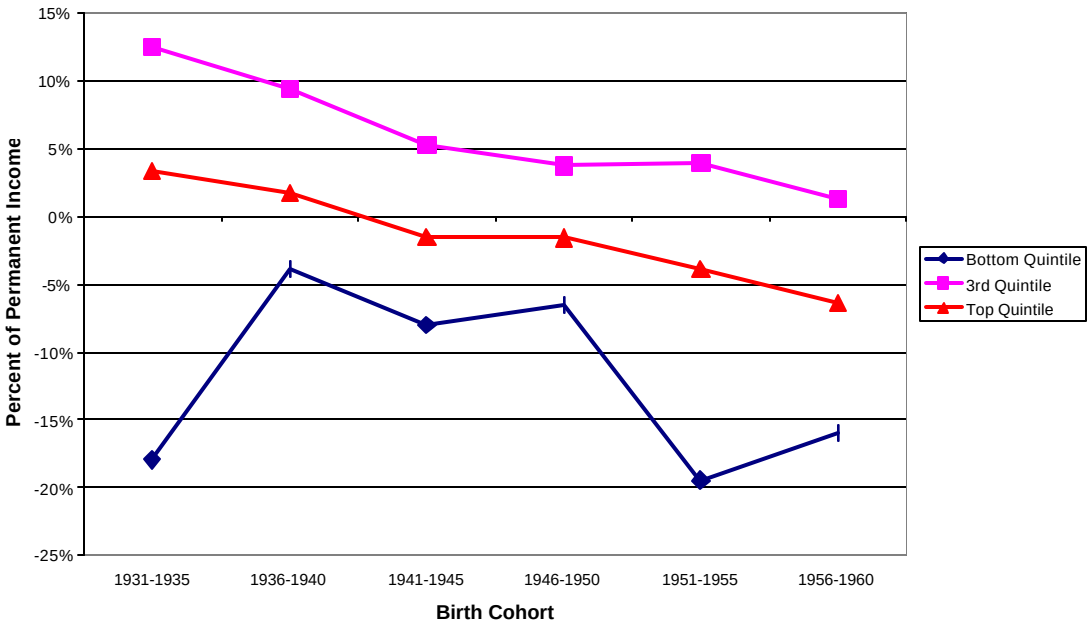
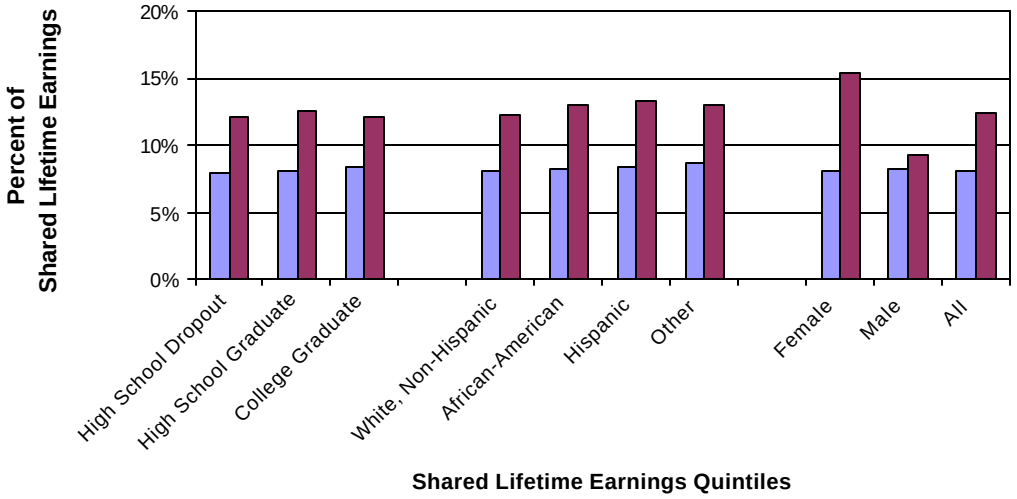


Figure 4a-b
Present Value of Shared OASI Taxes and Benefits
as a Percent of Shared Lifetime Earnings
By Education, Race, and Gender

1931-1935 Birth Cohorts



1956-1960 Birth Cohorts

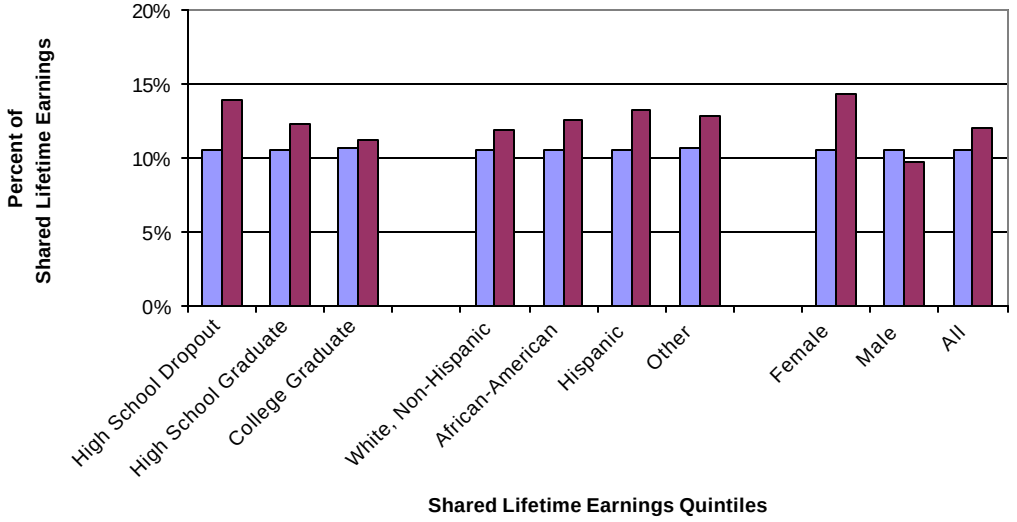
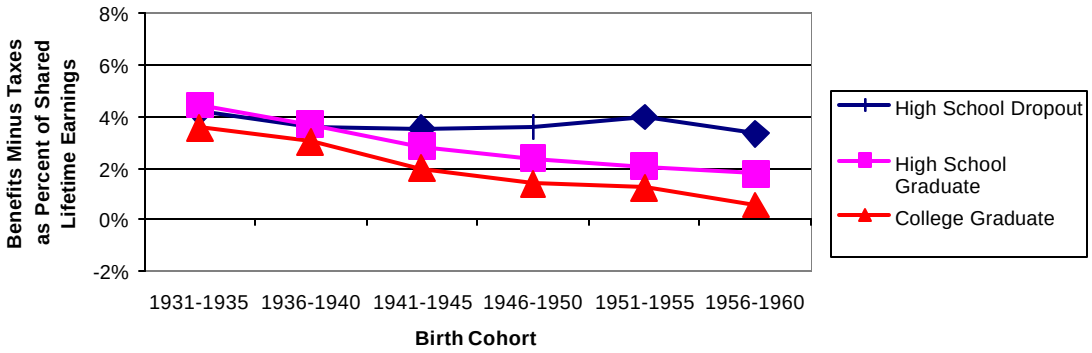
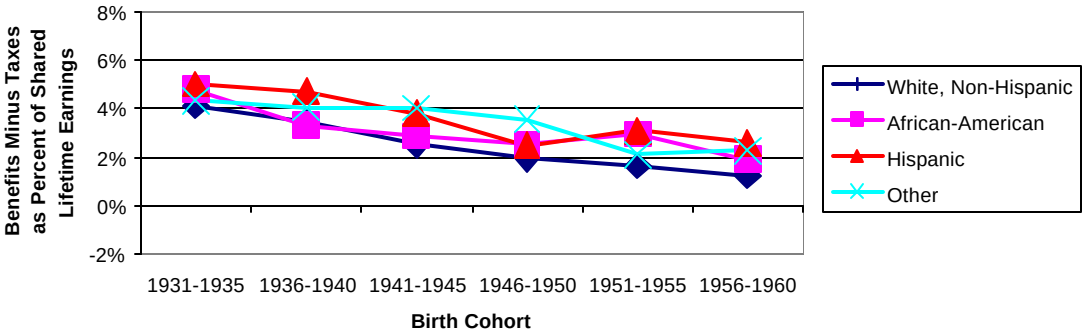


Figure 4c
OASI Net Benefits as a Percent of Shared Lifetime Earnings
by Birth Cohort

By Education



By Race



By Gender

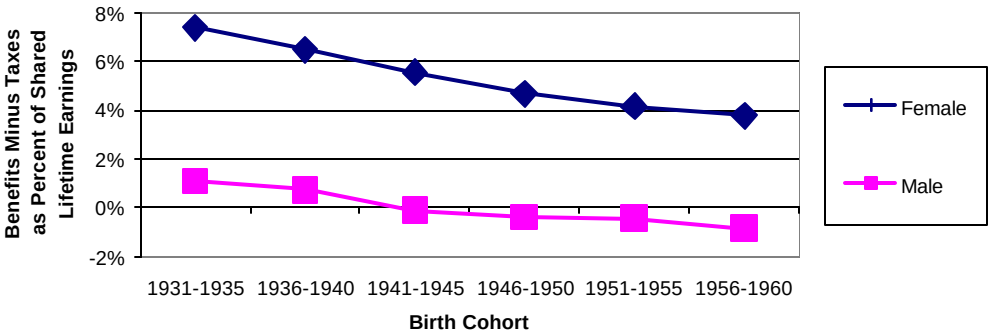
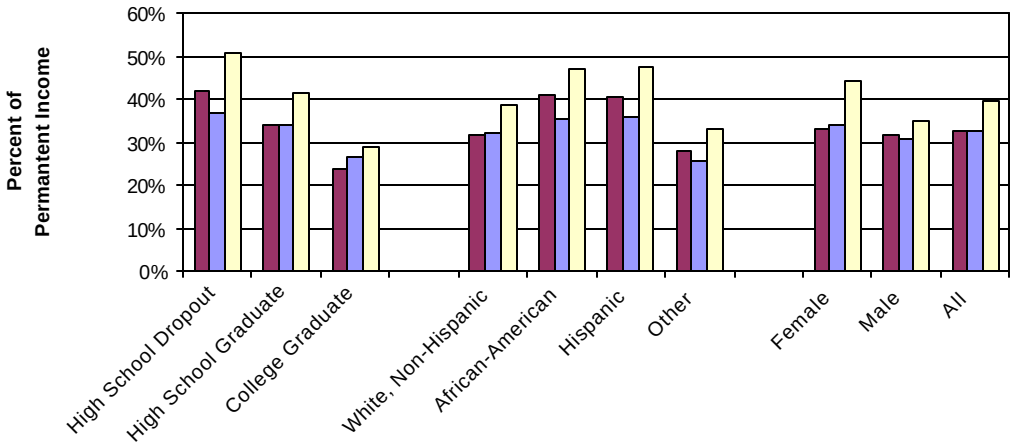


Figure 5a-b
Benefits and Foregone Benefits
as a Percent of Permanent Income
By Education, Race, and Gender

1931-1935 Birth Cohorts



1956-1960 Birth Cohorts

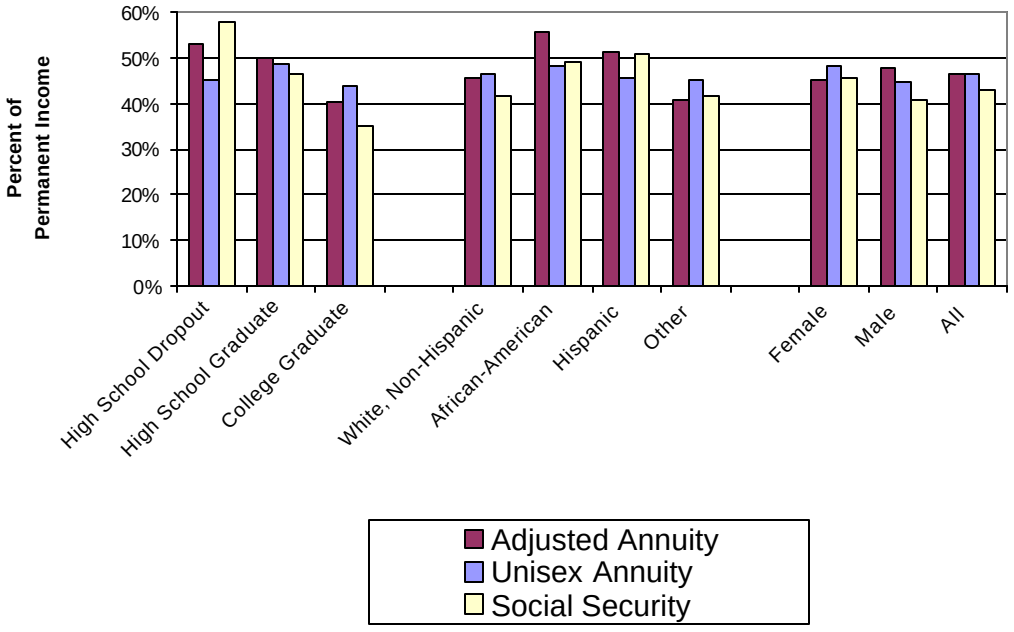
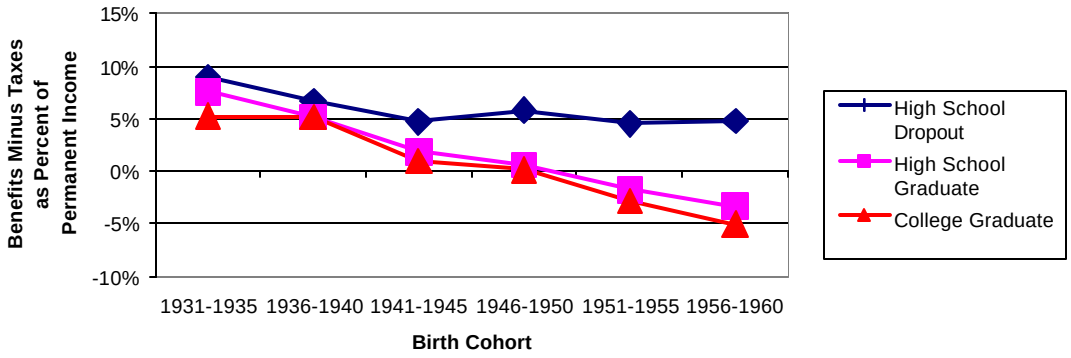
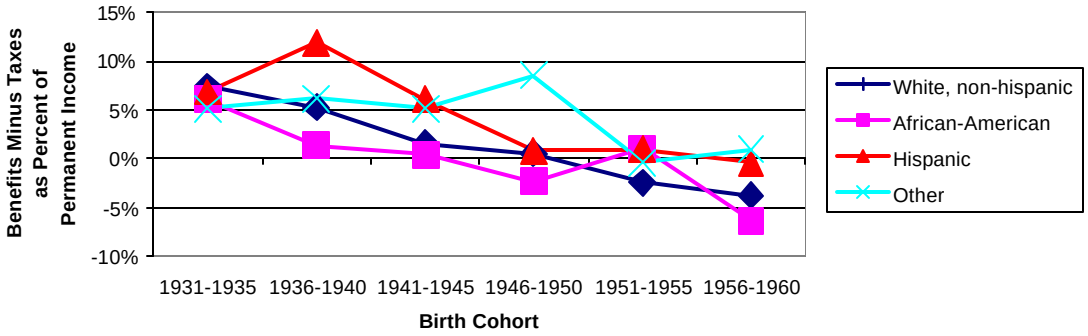


Figure 5c
Benefits and Foregone Benefits as a Percent of Permanent Income by Birth Cohort

By Education



By Race



By Gender

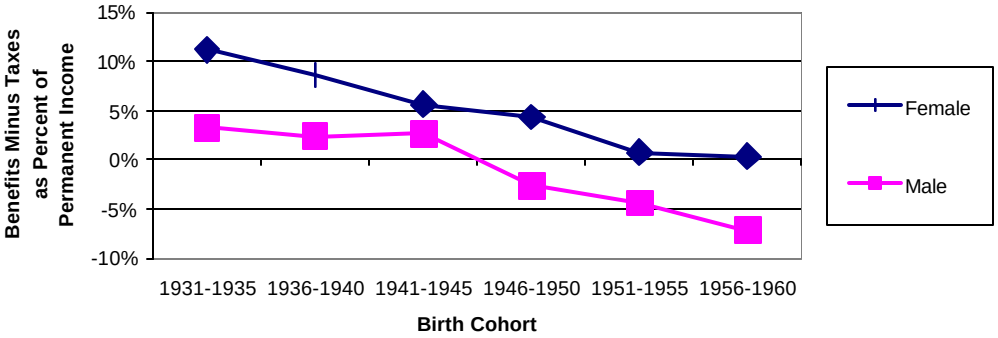


Table 1a. Distributional Effects of OASI, 1931-35 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Covered Earnings
Tax Payments Based on Individual Earnings
Benefits Attributable to Individual Workers*

		RATIOS TO COVERED EARNINGS					Benefits Minus Taxes	Percent Worker Benefits
			Present Value of SS Benefits					
Lifetime Earnings Quintile	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	Total	
Bottom Quintile	72177	7.6%	10.2%	44.0%	92.2%	146.4%	138.8%	7.0%
2nd Quintile	391234	8.1%	16.7%	2.7%	10.7%	30.0%	21.9%	55.6%
3rd Quintile	908018	8.2%	12.7%	0.1%	2.1%	14.9%	6.7%	85.3%
4th Quintile	1669622	8.1%	9.2%	0.0%	0.2%	9.4%	1.4%	97.4%
Top Quintile	2521170	8.4%	7.8%	0.0%	0.0%	7.9%	-0.5%	99.9%
ALL	1112444	8.2%	9.7%	0.8%	2.4%	12.8%	4.6%	75.5%

*Worker benefits are attributed to the worker. Spousal benefits are attributed to the spouse. Survivor benefits are attributed to the surviving spouse.

Table 1b. Distributional Effects of OASI, 1956-1960 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Covered Earnings
Tax Payments Based on Individual Earnings
Benefits Attributable to Individual Workers*

		RATIOS TO COVERED EARNINGS					Benefits Minus Taxes	Percent Worker Benefits
			Present Value of SS Benefits					
Lifetime Earnings Quintile	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	Total	
Bottom Quintile	271239	10.4%	19.0%	8.9%	19.0%	46.8%	36.4%	40.5%
2nd Quintile	904204	10.5%	14.5%	0.3%	3.3%	18.2%	7.7%	79.9%
3rd Quintile	1546713	10.5%	11.5%	0.0%	1.0%	12.5%	2.0%	92.2%
4th Quintile	2350899	10.6%	10.0%	0.0%	0.2%	10.3%	-0.3%	97.8%
Top Quintile	3728590	10.6%	7.9%	0.0%	0.0%	7.9%	-2.7%	99.7%
ALL	1760329	10.6%	10.1%	0.3%	1.2%	11.6%	1.0%	87.2%

*Worker benefits are attributed to the worker. Spousal benefits are attributed to the spouse. Survivor benefits are attributed to the surviving spouse.

Table 1c. Distributional Effects of OASI, 1931-60 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Covered Earnings
Tax Payments Based on Individual Earnings
Benefits Attributable to Individual Workers*

Lifetime Earnings Quintile	**Benefits Minus Taxes as % of Lifetime Earnings**					
	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960
Bottom Quintile	138.8%	93.7%	69.3%	50.7%	40.0%	36.4%
2nd Quintile	21.9%	17.8%	13.6%	10.4%	9.1%	7.7%
3rd Quintile	6.7%	5.0%	4.3%	3.3%	2.9%	2.0%
4th Quintile	1.4%	1.1%	0.6%	0.2%	0.1%	-0.3%
Top Quintile	-0.5%	-0.9%	-1.7%	-2.0%	-2.2%	-2.7%
ALL	4.6%	3.7%	2.8%	2.0%	1.7%	1.0%

*Worker benefits are attributed to the worker. Spousal benefits are attributed to the spouse. Survivor benefits are attributed to the surviving spouse.

Table 2a. Distributional Effects of OASI, 1931-1935 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Shared Covered Earnings*
Tax Payments Based on Shared Earnings
Benefits Shared by Couples**

			RATIOS TO COVERED EARNINGS				Benefits Minus Taxes	Percent Worker Benefits
			Present Value of SS Benefits					
Shared Lifetime Earnings Quintile	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	Total	% of Earnings
Bottom Quintile	355962	7.7%	11.0%	1.8%	6.6%	19.4%	11.7%	56.6%
2nd Quintile	842028	7.9%	9.7%	1.0%	4.4%	15.1%	7.3%	64.3%
3rd Quintile	1157207	8.0%	9.2%	1.0%	3.1%	13.3%	5.3%	69.3%
4th Quintile	1423966	8.2%	9.3%	0.8%	1.6%	11.7%	3.5%	79.2%
Top Quintile	1896726	8.4%	8.9%	0.2%	0.6%	9.7%	1.3%	92.0%
ALL	1135356	8.1%	9.3%	0.7%	2.3%	12.3%	4.2%	75.5%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 2b. Distributional Effects of OASI, 1956-1960 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Shared Covered Earnings*
Tax Payments Based on Shared Earnings
Benefits Shared by Couples**

			Present Value of SS Benefits				Benefits Minus Taxes	Percent Worker Benefits
Shared Lifetime Earnings Quintile	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	Total	% of Earnings
Bottom Quintile	518225	10.5%	15.9%	1.5%	4.8%	22.2%	11.7%	71.6%
2nd Quintile	1175545	10.5%	12.4%	0.5%	2.0%	15.0%	4.5%	82.9%
3rd Quintile	1665838	10.5%	11.0%	0.4%	1.5%	12.9%	2.4%	85.1%
4th Quintile	2199465	10.6%	9.9%	0.3%	1.1%	11.3%	0.7%	88.0%
Top Quintile	3159851	10.6%	8.9%	0.1%	0.3%	9.2%	-1.3%	95.9%
ALL	1743867	10.6%	10.4%	0.3%	1.2%	12.0%	1.4%	86.9%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 2c. Distributional Effects of OASI, 1931-60 Birth Cohorts
Individuals Ranked by Lifetime Present Value of Shared Covered Earnings*
Tax Payments Based on Shared Earnings
Benefits Shared by Couples**

Shared Lifetime Earnings	**Benefits Minus Taxes as % of Lifetime Earnings**					
Quintile	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960
Bottom Quintile	11.7%	12.4%	11.7%	11.5%	11.5%	11.7%
2nd Quintile	7.3%	6.4%	5.5%	5.0%	4.9%	4.5%
3rd Quintile	5.3%	4.1%	3.6%	2.8%	2.7%	2.4%
4th Quintile	3.5%	3.0%	2.0%	1.3%	1.0%	0.7%
Top Quintile	1.3%	0.7%	-0.2%	-0.6%	-0.8%	-1.3%
ALL	4.2%	3.5%	2.7%	2.1%	1.8%	1.4%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 3a. Distributional Effects of OASI, 1931-1935 Birth Cohorts
Individuals Ranked by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		Benefits as a Percentage of Income									
		Forgone Benefits		Benefits from OASI[3]							
Permanent Income Quintile	Income	Unisex Annuity[1]	Adjusted Annuity[2]	Worker	Spouse	Survivor	Total	Benefits-Unisex Annuity[4]	Unisex-Adj. Annuity[5]	Net Benefits, OASI[6]	% From Worker Benefits[7]
Bottom Quintile	7008	49.9%	79.4%	43.0%	4.9%	13.5%	61.4%	11.5%	-29.4%	-18.0%	70.0%
2nd Quintile	13234	43.5%	42.9%	41.4%	3.5%	16.9%	61.8%	18.2%	0.6%	18.8%	67.0%
3rd Quintile	17851	39.4%	38.2%	37.2%	3.0%	10.5%	50.7%	11.3%	1.2%	12.5%	73.4%
4th Quintile	23986	33.7%	29.6%	31.5%	2.1%	6.7%	40.3%	6.6%	4.1%	10.7%	78.1%
Top Quintile	41994	22.4%	20.6%	19.7%	1.2%	3.2%	24.0%	1.5%	1.9%	3.4%	82.0%
ALL	20815	32.5%	32.5%	29.7%	2.2%	7.7%	39.6%	7.2%	0.0%	7.2%	75.0%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of attributing tax burdens.

**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

[1] Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that annuity rate depends only on cohort average life expectancy.

[2] Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that worker can accurately forecast life span.

[3] Equals the level annual benefit beginning at age 62 that produces a present value of lifetime benefits that is equal to the present value of per-capita benefits received by the couple.

[4] Equals net benefit from OASI minus foregone benefits under a unisex annuity.

[5] Equals net benefit from a unisex annuity minus foregone benefits under an annuity based on actual life span.

[6] Equals net benefit from OASI minus foregone benefits under an annuity based on actual life span.

[7] Percent of total OASI benefit from the worker benefit.

Note: All annuities for married couples are assumed to be joint and survivor annuities, with survivor receiving 50 percent of combined benefit of couple.

Table 3b. Distributional Effects of OASI, 1956-1960 Birth Cohorts
Individuals Ranked by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		Benefits as a Percentage of Income									
		Forgone Benefits		Benefits from OASI							
Permanent Income Quintile	Income	Unisex Annuity[1]	Adjusted Annuity[2]	Worker	Spouse	Survivor	Total	Benefits-Unisex Annuity[4]	Unisex-Adj. Annuity[5]	Net Benefits, OASI[6]	% From Worker Benefits[7]
Bottom Quintile	9447	61.5%	85.9%	56.8%	4.0%	9.2%	70.0%	8.5%	-24.5%	-16.0%	81.2%
2nd Quintile	16561	61.5%	60.2%	54.0%	2.2%	9.3%	65.4%	4.0%	1.3%	5.3%	82.5%
3rd Quintile	22971	57.7%	54.1%	46.7%	1.4%	7.3%	55.4%	-2.3%	3.6%	1.3%	84.3%
4th Quintile	31687	50.6%	46.5%	38.6%	0.9%	4.5%	44.1%	-6.6%	4.2%	-2.4%	87.7%
Top Quintile	60321	33.5%	33.6%	25.1%	0.5%	1.6%	27.2%	-6.3%	-0.1%	-6.4%	92.2%
ALL	28197	46.4%	46.4%	37.2%	1.2%	4.6%	42.9%	-3.5%	0.0%	-3.5%	86.6%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of attributing tax burdens.

**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

[1]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that annuity rate depends only on cohort average life expectancy.

[2]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that worker can accurately forecast life span.

[3]Equals the level annual benefit beginning at age 62 that produces a present value of lifetime benefits that is equal to the present value of per-capita benefits received by the couple.

[4]Equals net benefit from OASI minus foregone benefits under a unisex annuity.

[5]Equals net benefit from a unisex annuity minus foregone benefits under an annuity based on actual life span.

[6]Equals net benefit from OASI minus foregone benefits under an annuity based on actual life span.

[7]Percent of total OASI benefit from the worker benefit.

Note: All annuities for married couples are assumed to be joint and survivor annuities, with survivor receiving 50 percent of combined benefit of couple.

Table 3c. Distributional Effects of OASI, 1931-60 Birth Cohorts
Individuals Ranked by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

Permanent Income	**Net Benefits From OASI as % of Permanent Income at 62**					
Quintile	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960
Bottom Quintile	-18.0%	-3.9%	-8.0%	-6.6%	-19.4%	-16.0%
2nd Quintile	18.8%	13.9%	12.2%	7.4%	4.5%	5.3%
3rd Quintile	12.5%	9.4%	5.3%	3.7%	3.9%	1.3%
4th Quintile	10.7%	7.0%	2.7%	1.2%	-0.7%	-2.4%
Top Quintile	3.4%	1.8%	-1.5%	-1.6%	-3.9%	-6.4%
ALL	7.2%	5.4%	1.8%	0.7%	-1.9%	-3.5%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 4a. Distributional Effects of OASI, 1931-35 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Present Value of Net Benefits
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		RATIOS TO COVERED EARNINGS:						
			Present Value of SS Benefits					
Population Groups	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	**Benefits Minus Taxes**	**Percent Worker Benefits**
Education Level								
High School Dropout	899077	7.9%	8.2%	0.7%	3.3%	12.1%	4.2%	67.4%
High School Graduate	1175225	8.1%	9.5%	0.7%	2.3%	12.5%	4.5%	75.7%
College Graduate	1331903	8.4%	9.9%	0.7%	1.5%	12.0%	3.6%	82.1%
Race								
White, Non-Hispanic	1190254	8.1%	9.2%	0.7%	2.3%	12.2%	4.1%	75.6%
African-American	905170	8.2%	9.5%	0.5%	2.9%	13.0%	4.8%	73.6%
Hispanic	873613	8.3%	10.0%	0.7%	2.6%	13.3%	5.0%	75.1%
Other	862518	8.7%	10.1%	0.6%	2.3%	13.0%	4.3%	77.3%
Gender								
Female	1077125	8.1%	10.2%	0.8%	4.5%	15.4%	7.4%	65.8%
Male	1199418	8.2%	8.5%	0.7%	0.1%	9.3%	1.1%	91.3%
ALL	1135356	8.1%	9.3%	0.7%	2.3%	12.3%	4.2%	75.5%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 4b. Distributional Effects of OASI, 1956-60 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Present Value of Net Benefits
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		RATIOS TO COVERED EARNINGS:						
			Present Value of SS Benefits					
Population Groups	Covered Earnings	OASI Taxes	Worker	Spouse	Survivor	Total	**Benefits Minus Taxes**	**Percent Worker Benefits**
Education Level								
High School Dropout	948747	10.5%	10.9%	0.6%	2.5%	13.9%	3.4%	78.3%
High School Graduate	1635644	10.5%	10.6%	0.3%	1.4%	12.3%	1.8%	86.1%
College Graduate	2311622	10.6%	10.1%	0.3%	0.8%	11.2%	0.6%	90.2%
Race								
White, Non-Hispanic	1870876	10.5%	10.3%	0.3%	1.2%	11.8%	1.2%	87.1%
African-American	1359381	10.6%	11.0%	0.3%	1.2%	12.5%	1.9%	88.5%
Hispanic	1260106	10.6%	11.2%	0.4%	1.6%	13.2%	2.6%	84.8%
Other	1642883	10.6%	10.9%	0.5%	1.5%	12.9%	2.3%	84.6%
Gender								
Female	1672372	10.6%	11.8%	0.4%	2.2%	14.3%	3.8%	82.4%
Male	1820107	10.6%	9.1%	0.3%	0.3%	9.7%	-0.8%	93.5%
ALL	1743867	10.6%	10.4%	0.3%	1.2%	12.0%	1.4%	86.9%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 4c. Distributional Effects of OASI, 1931-60 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Present Value of Net Benefits
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

	Benefits Minus Taxes as % of Lifetime Earnings					
Population Groups	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960
Education Level						
High School Dropout	4.2%	3.6%	3.5%	3.6%	4.0%	3.4%
High School Graduate	4.5%	3.7%	2.9%	2.4%	2.1%	1.8%
College Graduate	3.6%	3.0%	2.0%	1.4%	1.2%	0.6%
Race						
White, Non-Hispanic	4.1%	3.5%	2.5%	2.0%	1.6%	1.2%
African-American	4.8%	3.3%	2.9%	2.5%	2.9%	1.9%
Hispanic	5.0%	4.7%	3.8%	2.5%	3.1%	2.6%
Other	4.3%	4.0%	4.0%	3.5%	2.1%	2.3%
Gender						
Female	7.4%	6.5%	5.5%	4.7%	4.2%	3.8%
Male	1.1%	0.8%	-0.1%	-0.4%	-0.4%	-0.8%
ALL	4.2%	3.5%	2.7%	2.1%	1.8%	1.4%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

Table 5a. Distributional Effects of OASI, 1931-35 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		RATIOS TO COVERED EARNINGS:									
		Forgone Benefits		Net Benefits from OASI							
Permanent Income Quintile	Income	Unisex Annuity[1]	Adjusted Annuity[2]	Worker	Spouse	Survivor	Total	Benefits-Unisex Annuity[4]	Unisex-Adj. Annuity[5]	Net Benefits, OASI[6]	% From Worker Benefits[7]
Education Level											
High School Dropout	14252	36.7%	42.1%	34.2%	2.8%	14.0%	51.0%	14.3%	-5.4%	8.9%	67.1%
High School Graduate	20446	34.1%	33.8%	31.4%	2.4%	7.6%	41.4%	7.3%	0.3%	7.6%	75.9%
College Graduate	30741	26.6%	23.8%	23.5%	1.6%	3.9%	29.0%	2.5%	2.8%	5.2%	81.0%
Race											
White, Non-Hispanic	21833	32.4%	31.6%	29.2%	2.3%	7.4%	38.9%	6.6%	0.8%	7.3%	75.0%
African-American	15400	35.3%	41.1%	34.8%	1.9%	10.6%	47.2%	12.0%	-5.9%	6.1%	73.6%
Hispanic	14792	36.0%	40.5%	35.3%	2.7%	9.4%	47.4%	11.3%	-4.5%	6.8%	74.6%
Other	20888	25.7%	27.9%	25.5%	1.5%	6.0%	33.0%	7.3%	-2.1%	5.1%	77.2%
Gender											
Female	19547	34.1%	33.3%	30.2%	2.5%	11.8%	44.4%	10.3%	0.8%	11.2%	68.0%
Male	22216	30.9%	31.7%	29.3%	2.0%	3.7%	35.0%	4.1%	-0.8%	3.3%	83.6%
ALL	20818	32.5%	32.5%	29.7%	2.2%	7.7%	39.6%	7.2%	0.0%	7.2%	75.0%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of attributing tax burdens.

**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

[1]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that annuity rate depends only on cohort average life expectancy.

[2]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that worker can accurately forecast life span.

[3]Equals the level annual benefit beginning at age 62 that produces a present value of lifetime benefits that is equal to the present value of per-capita benefits received by the couple.

[4]Equals net benefit from OASI minus foregone benefits under a unisex annuity.

[5]Equals net benefit from a unisex annuity minus foregone benefits under an annuity based on actual life span.

[6]Equals net benefit from OASI minus foregone benefits under an annuity based on actual life span.

[7]Percent of total OASI benefit from the worker benefit.

Note: All annuities for married couples are assumed to be joint and survivor annuities, with survivor receiving 50 percent of combined benefit of couple.

Table 5b. Distributional Effects of OASI, 1956-60 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

		RATIOS TO COVERED EARNINGS:									
		Forgone Benefits		Net Benefits from OASI							
Permanent Income Quintile	Income	Unisex Annuity[1]	Adjusted Annuity[2]	Worker	Spouse	Survivor	Total	Benefits-Unisex Annuity[4]	Unisex-Adj. Annuity[5]	Net Benefits, OASI[6]	% From Worker Benefits[7]
Education Level											
High School Dropout	15897	45.0%	53.1%	45.5%	2.3%	10.2%	57.9%	12.9%	-8.1%	4.8%	78.6%
High School Graduate	25292	48.4%	49.9%	40.1%	1.2%	5.3%	46.6%	-1.8%	-1.5%	-3.3%	86.1%
College Graduate	39839	43.7%	40.2%	31.5%	0.9%	2.8%	35.2%	-8.6%	3.5%	-5.1%	89.5%
Race											
White, non-hispanic	30231	46.4%	45.4%	36.1%	1.1%	4.4%	41.6%	-4.8%	1.0%	-3.7%	86.7%
African-American	21124	48.4%	55.5%	43.1%	1.0%	5.0%	49.1%	0.8%	-7.1%	-6.4%	87.8%
Hispanic	20978	45.5%	51.2%	43.3%	1.5%	6.0%	50.8%	5.3%	-5.7%	-0.4%	85.2%
Other	27774	45.1%	40.9%	35.4%	1.5%	5.0%	41.8%	-3.2%	4.2%	0.9%	84.5%
Gender											
Female	26764	48.3%	45.0%	38.1%	1.2%	6.0%	45.4%	-2.9%	3.3%	0.4%	84.0%
Male	29733	44.7%	47.8%	36.3%	1.1%	3.3%	40.6%	-4.1%	-3.2%	-7.2%	89.3%
ALL	28201	46.4%	46.4%	37.2%	1.2%	4.6%	42.9%	-3.5%	0.0%	-3.5%	86.6%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of attributing tax burdens.

**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).

[1]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that annuity rate depends only on cohort average life expectancy.

[2]Level annuity that worker could purchase at age 62 with present value of lifetime tax payments, under the assumption that worker can accurately forecast life span.

[3]Equals the level annual benefit beginning at age 62 that produces a present value of lifetime benefits that is equal to the present value of per-capita benefits received by the couple.

[4]Equals net benefit from OASI minus foregone benefits under a unisex annuity.

[5]Equals net benefit from a unisex annuity minus foregone benefits under an annuity based on actual life span.

[6]Equals net benefit from OASI minus foregone benefits under an annuity based on actual life span.

[7]Percent of total OASI benefit from the worker benefit.

Note: All annuities for married couples are assumed to be joint and survivor annuities, with survivor receiving 50 percent of combined benefit of couple.

Table 5c. Distributional Effects of OASI, 1931-60 Birth Cohorts
Individuals Grouped by Education and Race
Well-Being Measured by Permanent Income at Age 62
Tax Payments Based on Shared Earnings*
Benefits Shared by Couples**

	Net Benefits From OASI as % of Permanent Income at 62					
Population Groups	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960
Education Level						
High School Dropout	8.9%	6.7%	4.7%	5.8%	4.6%	4.8%
High School Graduate	7.6%	5.2%	1.9%	0.6%	-1.8%	-3.3%
College Graduate	5.2%	5.2%	1.0%	0.1%	-2.8%	-5.1%
Race						
White, non-hispanic	7.3%	5.3%	1.6%	0.5%	-2.4%	-3.7%
African-American	6.1%	1.4%	0.4%	-2.3%	1.0%	-6.4%
Hispanic	6.8%	11.9%	6.0%	0.8%	1.0%	-0.4%
Other	5.1%	6.2%	5.1%	8.5%	-0.4%	0.9%
Gender						
Female	11.2%	8.6%	5.7%	4.3%	0.7%	0.4%
Male	3.3%	2.3%	2.6%	-2.7%	-4.4%	-7.2%
ALL	7.2%	5.4%	1.8%	0.7%	-1.9%	-3.5%

*Earnings of unmarried workers are attributed to the worker. Earnings of married workers are combined; each spouse gets fifty percent of earnings for purpose of measuring lifetime present value of earnings and attributing tax burdens.
**Married individuals are assumed to receive half the combined benefit of the couple. Single individuals receive whatever benefit they get, whether based on their own earnings; spousal benefit (for divorced individuals) or survivor benefit (for widows and widowers).