IMPLICATIONS OF THE BUSH COMMISSION PENSION REFORMS FOR MARRIED COUPLES

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Abstract

In December 2001 the President's Commission to Strengthen Social Security published a report describing plans to reform Social Security through the introduction of new, privately managed, defined-contribution pension accounts. The new accounts are to be financed by diverting a portion of payroll taxes that are now used to finance pensions under the existing defined-benefit public pension system. This paper evaluates the overall impact of the Commission's second plan on the distribution of retirement income and rates of return on pension contributions within and among future generations of married couples.

IMPLICATIONS OF THE BUSH COMMISSION PENSION REFORMS FOR MARRIED COUPLES

In December 2001 President Bush's Commission to Strengthen Social Security issued a report containing three proposals to reform the Social Security system. A crucial element in all three plans was the introduction of new individual defined-contribution pension accounts. The new accounts are to be financed by diverting part of the payroll taxes that fund defined-benefit pensions under the current system. In a previous paper we examined the economic and distributional effects of the Commission's proposals by comparing the expected pensions of future retirees with those they could anticipate under a continuation of the current system (Bosworth and Burtless, 2002). The analysis was incomplete, however, because it did not examine the implications of the Commission's plans for retirees who receive benefits as married couples rather than single workers. The married-couple provisions in Social Security offer many secondary earners the option of receiving a pension based on the earnings history of a current or former spouse rather than their own earnings histories.

The spousal benefits offered under Social Security have important distributional consequences. Roughly one-fifth of retirees currently receive dependents' or survivor benefits based on a spouse's earnings record. Some beneficiaries who receive spouse benefits do not have enough career earnings to qualify for Social Security in their own right, but other pensioners receive a benefit based on a spouse's record because that benefit exceeds the pension they would receive based on their own earnings. In this paper we examine the implications of the spouse benefit provisions for Social Security reform.

The Commission's first plan was put forth mainly to illustrate how individual defined-contribution accounts could be created with funds diverted from the traditional Social Security program. Taken together, the provisions of the Model 1 plan actually worsen the financial condition of the Social Security program over the next 75 years. The Commission's Model 2 plan comes closest to representing a complete reform package that recognizes the long-term deficit in the existing system as well as the problem of coordinating individual accounts with

traditional defined-contribution benefits. This paper focuses on the married-couple benefits provided by the Commission's Model 2 plan. We do not evaluate Model 3 because it is largely an incomplete variant of Model 2 that relies heavily on transfers from the general fund to restore balance.

Our conclusions about the ambiguous effect of the Commission's proposals on aggregate national saving and economic growth are unchanged from our earlier paper. None of the Commission's plans contained a fully worked out set of proposals for eliminating the cash flow imbalances that would result from diverting funds from the existing system into individual retirement accounts. However, the same problem arises in some critiques of the Commission's proposals, which fail to deal honestly with the looming insolvency of the current system. As in our previous paper, we deal with the funding imbalances by first establishing a "feasible benefits" baseline for the existing system that incorporates pay-as-you-go (Paygo) balance. The "feasible benefits" baseline restores long-term Social Security solvency through an equal emphasis on benefit reductions and tax increases. Under the 2001 assumptions of the OASDI trustees, these adjustments must begin no later than 2033. By 2075 Paygo balance requires a 24-percent increase in tax rates and an across-the-board 16-percent cut in benefits.[1] We then impose a similar Paygo funding requirement on the Commission's proposal.

The Commission's plans differ from other proposals to establish individual retirement accounts because of the President's insistence that a ceiling be placed on the total resources devoted to the retirement system. The total contribution rate for the current system plus the new individual account system was capped at 12.4 percent of covered earnings, the current OASDI tax rate. Thus, any additional pension costs resulting from a growing population of retirees must be offset by scaling back benefits provided under the retirement system. By implication, the President mandated that the individual accounts be financed as a "carve-out" of funds from Social Security rather than as a simple add-on to the existing system. The result is a very complicated proposal in which Social Security benefits must be reduced in a variety of ways to finance the new accounts. For workers who opt to participate in the individual account program, the plans establish a parallel set of "offset accounts" that reduce future Social Security benefits in

[1] We have based our analysis on the projections of the 2001 Trustees' Report. The percentage change in taxes is more than that for benefits because projected taxes are much smaller than benefit payments in 2075.

line with the discounted value of workers' contributions to the individual accounts. Unmarried retirees receive a net gain under the reform only to the extent that the investment earnings of their individual accounts exceed the assumed fixed return in the offset account.

The situation is even more complicated for couples. Over the past few decades it has become increasingly common for both a husband and a wife to have earnings. If both spouses participate in the individual accounts, there will be two individual accounts and two offsets. If one spouse is eligible to receive a spousal benefit under Old-Age and Survivors Insurance (OASI), both offsets will need to be charged against that spouse's OASI benefit. The couple will choose to receive the spousal OASI benefit if the lower-earning spouse's (pre-offset) retired-worker benefit is less than 50 percent of higher-earning spouse's retired-worker benefit. (Under the current Social Security formula, a dependent spouse is entitled to receive a spousal benefit equal to one-half the retired-worker benefit of the higher earning spouse.) The benefit option can be reconsidered upon the death of the higher-earning spouse, but at that point the choice is between the lower earner's retired-worker benefit and 100 percent of the deceased spouse's retired-worker benefit. The Survivor Insurance benefit will be reduced by the two offset amounts. Participation in the individual accounts is voluntary, further complicating the task of administering and explaining benefits under the new system, especially in cases when one spouse has elected to participate while the other has chosen to remain outside the new system.

In the following sections we outline a micro-simulation model created to evaluate the distributional effects of pension reform. The model's basic features were described in previous papers, but this paper expands our earlier description to cover the situation of married couples. We then proceed to show the effects of establishing a "feasible benefits" baseline for the existing system and for the introduction of the Commission's Model 2 reform proposal. The micro-simulation model is integrated with a larger macro-economic growth model that can incorporate the effects of the reforms on saving, capital formation, and future rates of economic growth. As we previously argued, however, the effects of the Commission's proposals on national saving are ambiguous and likely to be small, so we focus on the distributional consequences of the plans. The last section shows the effects of financial market risk as a source of variation in pension outcomes.

A Distributional Model of Pension Benefits

Distributional concerns are central to the debate over Social Security reform. The existing system is redistributional in that it promises larger benefits relative to contributions for workers with low lifetime earnings compared to those with high earnings. Social Security benefits also represent a larger fraction of the retirement income received by low lifetime earners. If Social Security is proportionately scaled back for all retirees, the loss of retirement income would be felt most acutely by those with low lifetime earnings.

Lifetime earnings profiles of married couples. To calculate distributional impacts, we must first define the lifetime earnings profiles of workers who will be affected by reform. In this and earlier papers we summarize the diversity of American age-earnings profiles by defining a small number of stylized earnings patterns that are individually distinctive but broadly representative of earnings profiles observed among U.S. workers born between 1926 and 1965. We calculate the impacts of reform using ten specific patterns of lifetime labor earnings. These career earnings profiles were estimated using the actual lifetime earnings patterns of about 63,000 men and 66,000 women born between 1926 and 1965. Nine of the profiles are based on earnings of people who reach age 62 without becoming disabled. Another one is based on the earnings records of the smaller group of workers which attains age 62 but does not accumulate enough earnings credits to become eligible for Social Security Old-Age Insurance (OAI) pensions.[2] The specific earnings profile of each worker was constructed using information from the Census Bureau's 1990-1993 Survey of Income and Program Participation (SIPP) matched to Social Security earnings records (SSER).[3] The SSER records contain information on Social-Security-covered earnings by calendar year for the period from 1951 through 1999. In addition, we have projected earnings out to 2030 from the MINT micro data set of the Social Security

[2] To qualify for an OAI pension at age 62, workers must accumulate at least 40 quarters of Social Security earnings credits by the end of the calendar year in which they attain age 61. A worker who earns slightly more than $3,000 per year in (indexed) wages for at least 10 years meets this qualification requirement. We have purposefully excluded all workers who are expected to die or to become disabled before reaching the early retirement age. Our analysis focuses on the OAI retirement pension rather than the other components of the OASDI program. An assessment that includes Disability Insurance and young survivors' benefits would require a major expansion of the analysis.

[3] Further details about the data set are provided in Toder et al. (1999, especially chapters 2 and 8). See also Bosworth, Burtless, and Steuerle (1999). However, the tabulations of lifetime earnings used to generate estimates of lifetime earnings profiles are based on a later version of the MINT model (see Toder et al., 2002, chapter 2).

Administration.[4] We measure earnings at each age relative to the economy-wide average wage in that year as reported by the SSA.

To calculate representative age-earnings profiles we divided the workers into nine categories based on the average *level* of their relative earnings over their career (lower, middle, and top thirds of the lifetime earnings distribution) and the lifetime *trend* in their career age-earnings profile (declining, level, and rising trends).[5] These calculations for the nine categories of workers are based solely on workers who survive to age 62, became entitled for OAI pensions at that age, and do not become entitled to Social Security Disability Insurance (DI) benefits before age 62. We also calculated the average lifetime earnings profile of workers who have some Social-Security-covered earnings, but not enough to qualify for an OAI pension at age 62. Finally, we calculated the composite or weighted average earnings profile of all workers who become eligible for an OAI pension by age 62. (This is simply the weighted average profile of the first nine groups of workers described above.)

Figure 1 shows the average lifetime earnings profiles of each of the 10 categories of workers just described. The figure also shows the earnings profile of the "composite worker," that is, the worker who represents the weighted average of the 9 profiles of workers who become entitled to an OAI pension at age 62. Each panel in the figure shows a single age-earnings profile which is based on the average of the age-specific earnings of all workers in the category. At each year of age, the chart shows the worker's annual earnings measured as a percentage of economy-wide earnings at that age.

For purposes of calculating workers' retirement benefits under the current Social Security formula, it is enough to know the average level of each worker's career wages (specifically, the highest 35 years of indexed earnings). On the other hand, the trend or time path of earnings has a major impact on benefits under a defined-contribution pension plan. Contributions into a defined-contribution account in the early years of a worker's career earn investment returns over a longer period, providing a larger pension per dollar contributed than contributions made late in

[4] The MINT micro-data file that has been assembled by the Division of Policy Analysis of the Social Security Administration. The file includes a wide range of actual and projected economic and demographic information of the population born between 1931-65. The projections for earnings extend out to 2027.

[5] A detailed explanation of the classification of workers into the nine profiles is provided in Bosworth and Burtless (2000) and Bosworth, Burtless, and Sahm (2001).

a career. The 10 earnings profiles are the average of the age-earnings profiles of the workers within each category. Because each worker's earnings at a given age is measured relative to the economy-wide wage in the same year, it is a simple matter to link the microeconomic simulations to the macroeconomic predictions of average wages in the entire U.S. economy. The micro-simulation model uses the wage profiles and the estimate of economy-wide average wages in a given year to calculate a worker's actual career earnings in that year. It is then straightforward to calculate representative workers' actual earnings at each age from 22 through 61 and the OAI pensions to which they would become entitled. Finally, we have calculated the appropriate sampling weights of male and female workers in each of the 10 earnings categories for each year in the 2000-2025 period using information in the MINT data set.

We constructed a micro-simulation model to calculate pension benefits for couples by matching each of the 10 male profiles with the 10 possible combinations of female earnings profiles, yielding a 10×10 matrix with 100 possible combinations of husband-wife earnings profiles. From the MINT data set we can obtain projected sample weights for married couples to attach to each of the 100 combinations. These sample weights can be derived for cohorts retiring out to 2025. After 2025, we assume that the distribution of individuals among the 100 possible couple pairings remains constant based on sampling weights predicted by the MINT model for 2025.

The simulation model computes the appropriate OASI pension for each couple based on the assumption that both spouses are born in the same year and retire at age 62. Given the earnings profile for each spouse, it is also straightforward to calculate the investment accumulation in the individual retirement account, and the corresponding offset accumulation, that each worker would obtain under the Commission's proposal.

Benefits under current law and under a solvent alternative. Our model can be used to calculate the value to workers and married couples of the existing OASI program as well as reformed versions of the system. We compute the value of pensions using two measures, the replacement rate and the internal rate of return. The replacement rate (RR) is computed as the ratio of a worker's average annual retirement benefits to after-tax average annual earnings.[6] For a married couple, the RR is measured as ratio of the *sum* of the couple's pensions to the *sum* of

[6] Our formulation of the replacement rate differs from some other measures of pension replacement because we use an average work-life measure of net-of-OASI-payroll-tax earnings in our calculation.

its average covered earnings. The internal rate of return (IRR) is obtained by equating the discounted real value of contributions and benefits over both spouses' lifetimes.[7] By implication, the internal return reflects the effects of changes in both tax rates and benefit formulas that may take place during the couple's working careers and retirements. An increase in life expectancy raises workers' internal rate of return on their contributions, while it has virtually no effect on the replacement rate. Our baseline calculations reflect the intermediate forecast of the 2001 OASDI Trustees' Report and current-law provisions regarding future taxes and benefits.

Some basic statistics on covered earnings, replacement rates, and internal rates of return under current law are displayed in Table 1. The calculations are based on the average predicted experiences of people attaining 62 in four different years – 2000, 2025, 2050, and 2075. All of the calculations are based on the assumption that workers have 40-year careers that begin at age 22 and end at age 62, and retirement benefits are claimed on the worker's 62nd birthday. For men attaining 62 in 2000, "relative average lifetime earnings" is 103 percent of the economy-wide average wage.[8] This implies that during an average year during an average male worker's career, he earned a wage that was slightly higher than the economy-wide wage in the year. Women attaining age 62 in 2000 had significantly lower career-average earnings, just 45 percent of the average economy-wide wage. For male and female workers taken together, the relative average lifetime wage is 76 percent of the average economy-wide wage. In years after 2000 the relative earnings of men are somewhat lower and those of women are significantly higher. The improvement in women's lifetime earnings reflects the steady rise in their annual wages and in the number of years that they participate in the labor force.

The top lines in Table 1 show average replacement rates and internal rates of return for men and women under the assumption that all workers claim Old-Age pensions as single workers and do not have dependents who claim Survivors Insurance benefits. The internal rates of return for men and women are calculated using separate life tables for the two sexes.[9] The

[7] Our calculation of taxes and benefits is limited to the OASI component of the Social Security program. It ignores contributions and benefits under Disability Insurance as well as Survivors Insurance benefits obtained before age 62.

[8] The calculations for individual men and women are based solely on the earnings profiles of workers who accumulated enough Social Security earnings credits to become eligible for an Old-Age pension at age 62. Workers with lower earnings are excluded from this calculation.

[9] In principle, the calculations could also reflect different life expectancies for workers based on their average lifetime earnings, since workers with low earnings have shorter life expectancy than

OAI replacement rates are always higher for women than for men, because the redistributional OAI benefit formula favors low earners over high earners. Longer female life expectancy is another factor contributing to the higher return on women's contributions to OAI.

Both the replacement rate and the IRR are projected to decline for workers who retire in the future. Benefits will decline in relation to wages because of the increase in the normal retirement age from 65 years and 2 months in 2000 to 67 years by 2022. A higher normal retirement age produces a larger actuarial reduction in OAI pensions for those who retire at the early entitlement age, when all workers are assumed to claim their pension. In addition, workers who retire in the future must contribute a larger percentage of their lifetime wages to Social Security than is the case for workers retiring in 2000. Workers who entered the labor force in 1960 paid lower Social Security taxes early in their careers than were paid by workers who entered the labor force more recently. Note that the male-female gap in replacement rates and internal returns narrows over time as the earnings gap between men and women shrinks. (We assume that the gender earnings gap stabilizes after 2025.)

Results for married couples are displayed in the lower part of the table. The calculations reflect the weighted experiences of 99 married couples who become entitled to OASI pensions. (In the 10x10 matrix of male and female earnings profiles, the excluded cell represents a married couple where neither spouse earns enough covered wages to become entitled to Social Security benefits.) The replacement rate is the average annual OASI pension of the couple, including survivor benefits, divided by the 40-year average of the couple's combined post-OASI-tax earnings. As noted above, the IRR is calculated based on the couple's total lifetime contributions and benefits. We have divided couples into three roughly equal groups on the basis of the sum of their lifetime earnings. The replacement rate for low-earnings couples in 2000 is 71 percent compared to a rate of 41 percent for couples in the top earnings class. This is a smaller difference in the replacement rate than would be found among individuals, because a sizable percentage of spouses with little or no earnings are married to spouses who have average- or above-average earnings. Thus, the lifetime earnings of couples are more evenly distributed than would be implied by a focus on workers as individuals. At the same time, the average replacement rate for low-combined-earnings couples is higher than the rate for low-wage single

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workers of the same sex who have higher average wages. However, this extension was too complicated to be included in the present paper.

workers because many of them can take advantage of spouse and survivor benefits, which effectively provide a subsidy to couples that include a very low earner.

Couples' replacement rates and internal returns are projected to fall between 2000 and 2025. The extent of the decline will be larger than is the case among workers treated as individuals because the growth in lifetime female earnings will reduce the importance of Social Security spouse and survivor benefits. The average couple benefit will rise as more secondary earners qualify for a pension based on their own earnings records, but the increase in the OASI pension will be smaller than the increase in the combined earnings of the couple. By 2025, a smaller percentage of new retirees will make use of the spouse benefit, and the average replacement rate and IRRs for couples will be more nearly similar to those that they would obtain as single workers.

If current law is maintained, very little change in replacement rates and internal returns will occur after 2025. This forecast depends, however, on the assumption that current-law tax and benefit formulas will be maintained throughout the projection planning horizon. This assumption is unrealistic since the system faces an actuarial deficit equal to 1.9 percent of payroll over the 75-year period. Social Security reserves will be exhausted by 2038 unless benefits are reduced or taxes increased. It is more plausible to expect the system will be reformed to preserve solvency.

To establish a neutral, but consistent, baseline forecast, we have imposed a minimal requirement of future Paygo balance. We have constructed this policy forecast under the assumption that there will be roughly equal adjustments in Social Security tax rates and benefits. Since we require that the system maintain Trust Fund reserves equal to at least one year of benefit payments, the tax increases and benefit cuts must begin in 2033 under the Trustees' 2001 assumptions.[10] Aggregate program adjustments over the 75-year planning horizon are shown in

[10] The OASDI Trust Fund currently holds reserves far larger than one year's benefit payments, and the ratio of reserves to annual outlays is expected to grow over the next decade. In our implementation of Paygo balance, we allow this accumulation to continue, but tax increases and benefit reductions are triggered when the Trust Fund falls below one year's OASDI outlays. To determine tax increases and benefit reductions under the "feasible benefits" baseline, we first calculated the size and timing of benefit reductions needed to maintain balance in the absence of any tax increase, and then we reduced the scheduled benefit cuts by one-half. All of the remaining adjustment to achieve Paygo balance was achieved through periodic payroll tax increases. The percentage increases in taxes and reductions in outlays are not equal in size because outlays are much larger than income in the current law baseline. We did not alter the income tax treatment of benefits, the revenue of which is credited to the OASDI fund.

Figure 2. By 2075 the OASDI contribution rate must increase almost one-quarter (or 3 percentage points) and traditional retirement benefits must be cut about one-sixth to maintain program solvency.

The resulting implications for replacement rates and rates of return are displayed in Table 2.[11] The Paygo adjustments have no significant effect on workers who retire in 2000 because the great majority will die before the first OASI benefit cut is needed. Workers who retire in 2025 will be affected by the benefit reductions, but they will not face higher contribution rates than those scheduled under current law. Worker cohorts who retire in 2050 and 2075 will both pay higher taxes and receive lower benefits than those scheduled under current law. By 2075 the replacement rate for new beneficiaries will be reduced by 15 percent relative to the current-law projections in Table 1, and the internal rate of return will fall by a percentage point.

The magnitude of the adjustments will be nearly identical for couples and for single workers, and the proportionate reduction of benefits is the same for low- and high-earning couples.[12] With the "feasible benefits" baseline the average internal rate of return for both individuals and couples will steadily decline to only half its current rate over the next 75 years, and it will fall below one percent for couples in the top third of the income distribution. While there are many other combinations of benefit cuts and tax increases that could restore the system to balance, we believe this option is an even-handed compromise between the interests of future taxpayers and pensioners.

Pensions under the Commission's plan. Replacement rates and internal rates of return can also be calculated for the presidential commission's reform plan. Before we present these estimates it may be helpful to describe the proposal in some detail. The Commission's Model 2 plan eliminates the long-run deficit in Social Security by indexing the formula factors used to compute a worker's initial OASDI benefit by the rate of price inflation rather the rate of

[11] We assume that OASDI pensions are reduced for both old and new pensioners in every year when a benefit adjustment is needed to bring the program into Paygo balance. Under an alternative assumption, retirees' benefits would be cut more dramatically when they first retire but then maintained at the same real level throughout their retirement. If the initial benefit cuts are calculated by a far-sighted planner so as to maintain Paygo balance in future years, the lifetime replacement rates and internal rates of return under this alternative should be very similar to the ones displayed in Table 2.

[12] Note, however, that while the proportional benefit cut is similar across all income levels, the Social Security pension is a larger percentage of total retirement income for workers in the lower ranks of the lifetime earnings distribution (Office of Policy, Social Security Administration, 2000, p. 16).

economy-wide wage increase, beginning in 2009.[13] The ultimate impact of this change on traditional benefits is very large. Initial Social Security pensions are predicted to decline at a rate of 1 percent per year (the assumed rate of future real wage growth) relative to pensions promised under current law. The real value of the average benefit would be cut in half by the end of the 75-year horizon, a benefit reduction that completely eliminates the actuarial deficit in the OASDI program. If only this element of the Model 2 plan were implemented, predicted OASDI outlays decline at a pace fast enough to ensure that the Trust Fund would not be exhausted in any future year. The size of the benefit cut is in fact large enough to leave room for small benefit improvements for low-wage workers and surviving spouses. Benefits are increased as much as 40 percent for low wage workers who earn taxable wages in at least 20 years. The widow(er)'s benefit would also be raised to a minimum of 75 percent of the previous combined benefit received by a couple. On balance, the changes in traditional benefits envisaged under Model 2 would generate large annual surpluses in the OASDI program by the end of the 75-year projection period.

Having restored balance in the traditional system through benefit cuts, Model 2 then introduces an individual retirement account using payroll tax revenues diverted from the traditional Social Security program. Workers would be permitted to invest up to 4 percent of their taxable wages in individual accounts, but with a cap on contributions of $1,000 per year (indexed to future average wage increases). The Actuary estimates aggregate contributions, with 100 percent participation, will ultimately rise to 2.4 percent of taxable payroll.

Although the OASDI Trust Fund initially suffers a revenue loss as a result of the diversion of contributions, it is ultimately compensated through an offsetting reduction in the future OASDI benefits of workers who opt to participate in the individual accounts. The offset for each worker is computed by creating a notional account with an assumed real rate of return of 2 percent. The account accumulates to retirement and is converted to an annuity using standard unisex life tables and interest rate assumptions of the OASDI program. A participating worker's OASDI pension is then reduced by the amount of the notional annuity.[14] Thus, workers who

[13] The date of 2009 was selected to meet the President's mandate that proposed reforms should not reduce the benefits of workers who are near retirement.

[14] The offset applies to both retirement and disability pensions, and in the latter case the offset is computed at the time disability payments begin, that is, after a worker becomes disabled.

contribute to individual accounts will have their traditional OASDI pensions reduced in two ways. The OASDI formula is modified to reflect price indexing rather than wage indexing of the initial pension, and the resulting OASDI pension is then reduced by the application of the offset formula. Note that the offset is calculated in a way that implicitly subsidizes contributions to the new accounts. The offset formula applies a 2 percent real rate of interest to the calculation of the discounted value of contributions, but this is less than the 3 percent return that the OASDI program is expected to earn on Trust Fund assets.

Even with sizeable cuts in traditional OASDI pensions, caused by the formula change and the application of the offset formula, the diversion of contributions under the Commission's plan will accelerate the depletion of Trust Fund reserves. The Actuary predicts the Trust Fund will be exhausted by about 2020, requiring a large infusion of general government revenues if OASDI benefits under the reformed program are to be financed. Transfers from the general fund are needed for more than a quarter century after 2020. The steady reduction of traditional benefits through price indexation and the notional account offset will ultimately push the OASDI program back into surplus. Over the full 75-year planning horizon, the combined effects of the Model 2 proposals result in a small actuarial surplus in Social Security, even though the plan creates a sizeable but temporary cash-flow imbalance after 2020.

In our evaluation of this proposal, we impose the same requirements as for our "feasible benefits" baseline, namely, Paygo funding balance within the OASDI program. Under our implementation of this rule, the Trust Fund reserves are not allowed to fall below the annual outlays of the OASDI program. In light of the President's mandate that the total contribution rate for Social Security and individual account pensions must be capped at the current 12.4 percent rate, all of the adjustments needed to maintain Paygo balance take the form of cuts in pensions under the traditional OASDI program. The resulting pattern of adjustments is displayed in Figure 3. The dashed line shows the steady decline in the basic OASDI benefit that results from the new formula for indexing initial OASDI pensions as well as the method of calculating benefits for workers with low steady wages. Substitution of price indexing for wage indexing in the formula for new pensions will reduce a new retiree's benefit by about one-third by 2050, but the average benefit of all beneficiaries would decline by only 20 percent by that year. The second line adds the benefit reductions that result from implementing the offset account for retirees with individual accounts. The net result of these two reductions in the traditional OASDI

pension is to reduce average benefits of the OASDI program by approximately one-third in 2050 and 50 percent in 2075 compared with benefits payable under current law. The bold line in Figure 3 indicates the additional adjustments in traditional OASDI pensions needed in order to maintain Paygo balance. The Paygo adjustment is quite large between 2020 and 2050 when payroll tax contributions are being diverted from the OASDI Trust Fund into the new individual accounts, but as the offset accounts and new indexing procedure grow in importance, the need for further Paygo adjustments declines and it actually changes sign in 2057, boosting benefits in subsequent years. Thus, the average OASI pension benefit would be cut by 50 percent in 2050 and 55 percent in 2075, relative to current law.

Some of the benefit cuts are offset by the increasing flow of pension incomes financed out of the new individual retirement accounts. The individual account would provide a benefit equivalent to about 40 percent of benefits promised under current law to average couples who retire in 2050. Our tabulations of the value of OASI and individual-account (IA) pensions under Model 2 are reported in Tables 3 and 4. Workers who participate in individual accounts are assumed to invest their contributions in a 50/50 mix of bonds and stocks, with portfolio re-balancing at the end of every year to maintain this investment allocation. Table 3 illustrates the effects of the Commission's Model 2 plan *in the absence* of a Paygo funding requirement. Under this assumption, the cash-flow shortfall in the OASDI program between 2020 and 2057 is covered by annual transfers from the U.S. Treasury. Focusing first on the results when individual workers are treated as single workers, the results largely mirror those in our previous paper. However, the new calculations use separate life tables for men and women to calculate survival probabilities for the two sexes. (In our earlier paper, we used a unisex life table to calculate workers' survival probabilities after their 62nd birthdays, and we made no distinction between male and female workers.)

Over the 75-year projection period, the Commission's Model 2 plan causes OASI benefits to be dramatically reduced for successive cohorts of new retirees, with a fall in the average replacement rate from 51 percent in 2000 to only 15 percent by 2075. Two-thirds of this decline is the result of the price indexation of initial benefits, and one-third is due to the offset for workers' diversion of Social Security payroll taxes into their individual pension accounts. The internal rate of return on contributions to the OASI accounts will decline to zero for all workers, and it will fall below zero for males. Of course, a significant percentage of lost benefits

will be replaced through pensions financed out of the individual accounts. The pension from the private accounts replaces 18.4 percent of lifetime wages for the average worker by 2075. The combined replacement rate from traditional OASI pensions and the individual account pension is thus predicted to fall from 51 percent to 33 percent – more than one-third – between 2000 and 2075 relative to the benefits promised under current law.[15]

The implications for the average couple are similar to those for individuals, although the loss of pension income is, if anything, even larger than it is when workers are treated as single persons. However, the Model 2 plan contains some special provisions that help low-income couples. First, low-wage couples gain from the liberalization of benefits for low-wage workers who have steady earnings. They also benefit from a provision that increases the minimum survivor pension. Finally, because the Model 2 plan includes a $1,000 cap on annual contributions, low-income workers can divert a larger percentage of their OASDI payroll taxes into the subsidized individual accounts than workers with higher wages. Thus, couples in the lower third of the income distribution suffer a somewhat smaller reduction in OASI benefits and receive a proportionately larger annuity from the individual account than couples who have higher earnings. Overall the replacement rate for low-income couples falls by 26 percent relative to current law in 2075, compared to a 32-percent decline for couples in the top third of the distribution. The internal rate of return on OASI contributions becomes highly negative by 2075 for couples in the top third of the distribution, while couples with combined wages at the bottom of the distribution continue to receive positive returns under the traditional program.

As noted earlier, the Commission's Model 2 plan does not solve Social Security's funding problem, since it produces large cash-flow deficits between 2020 and 2057. Table 4 shows results from a simulation that incorporates a Paygo financing constraint. In this simulation, the OASDI system does not receive any transfers from the U.S. Treasury. The benefit adjustments required to maintain solvency occur much earlier than in the "feasible benefits" baseline, and the OASI benefit cuts are much larger. In view of the timing of the benefit cuts, a large fraction of the required reduction in OASI benefits is borne by workers who begin retiring around 2020. The worker cohort which retires in 2025 will have contributed to an individual account for only 20 years, and the annuity from the account is far less than half what

[15] Since there are no changes in tax rates, all of the decline in the replacement rate relative to current law is the result of reduced benefits.

will be received by retirees who have comparable earnings in 2050 and who have contributed to individual accounts over a full career. The combined replacement rate from OASI and individual account pensions reaches a low point for 2025 retirees and rises for those who retire in 2050. In fact, the benefit reductions are so large immediately after 2025 that the average new retiree in 2025 would receive a total real benefit, OASI plus IA, that is about 8 percent lower than the OASI pensions received by workers who retire in 2000.

The internal rate of return on OASI contributions would also fall very sharply, from an average of 3.4 percent for workers retiring in 2000 to only 1.1 percent for those who retire in 2025, and would then remain unchanged until after 2050. In effect, there would be a reversal of the normal intergenerational transfer from the young to the old: the benefits of those retiring around 2025 are reduced to fund the build up of reserves in the individual accounts of those retiring around 2050. The Paygo adjustment actually allows for a small boost in benefits after 2060, and it eliminates the negative internal rate of return for all but couples in the top third of the income distribution.[16]

The analysis shows that preserving the existing system under the "feasible benefits" plan would provide much better retirement incomes than the Commission's plan over the next 25-35 years, while adopting the Commission's plan could be relatively less disadvantageous for workers who will retire in the more distant future. The logic of this result should be clear. A Paygo retirement system provides transfers from younger to older generations. By reducing the scope of the Paygo system, the individual account plan eliminates some of these transfers, depressing the retirement incomes of workers who will retire in the near future. In the more distant future, the reduction in transfers under the Paygo system is made up by the higher assumed returns that will be earned in workers' individual retirement accounts. The President and Commission decided to fund the individual accounts out of existing OASDI contributions. When this choice is combined with a ceiling on payroll tax rates and our Paygo rule that requires all future OASDI benefit payments to be financed out of current contributions, there is a reverse transfer from older to younger generations: The benefits of those retiring around 2025 must be reduced to finance the build-up of reserves in the individual accounts of younger workers.

[16] The magnitude of the upward Paygo adjustment in 2075 would be even larger had we continued the price indexation in subsequent years. However, the decline in the average OASI replacement rate to only 15 percent and the growing surpluses of the fund, suggest that further scaling back of benefits is not needed.

The impact of the individual account plan on income distribution across generations is due in part to the Paygo rule we applied to assure that OASDI benefits are affordable with revenues available to the traditional Social Security system. If the OASDI program received transfers from the general fund to pay for a fraction of benefits after the Trust Fund were exhausted, workers who retire over the next four decades would not need to accept the deep pension losses shown in Table 4. Unfortunately, the transfers would have to be funded with higher non-Social-Security taxes, lower non-Social-Security public spending, or increased borrowing. Any of these alternatives would lower the consumption of at least one and possibly several generations of workers.

Variability of individual-account pensions

The annuities financed out of individual accounts will vary depending on the investment strategy of individual workers and market rates of return over a worker's career. Financial market returns vary widely from one year to the next and often bear little apparent relation to the underlying physical return on capital. Equity returns in particular deviate strongly but randomly from the average equity return, with deviations that may persist for a decade or longer. We model this process as a normal deviation in the financial return on corporate equities. The implications of financial risk on retirement incomes are evaluated by adding a stochastic term to the equation for the equity return,

$$(1) \quad r_{ei} = r'_{ei} + \mu_i ,$$

where r_{ei} is the equity return in year i and μ is a random error term. Using data on equity returns covering the period from 1871 to 2000, we have estimated that the standard deviation in the annual return is 17 percentage points. The projected real return on equities over the 75 years from 2001 through 2075 averages 5.9 percent.[17]

The government bond rate is treated as far more certain. In the results displayed here, we assume that the future real government bond rate will follow the path predicted under the

[17] This is lower than the historical mean return from 1871 through 2000 for a simple reason. We assume that the total return on corporate capital will have the same mean return as observed in historical data. If the bond rate of return remains as high as it has been in recent years – and as high as projected by the Social Security Trustees – then a smaller percentage of future corporate cash flow can be returned to equity holders as dividends and capital gains on their share holdings. The future expected rate of return on equities must therefore decline somewhat compared with the long-term historical return.

intermediate assumptions of the OASDI Trustees' 2001 *Annual Report.* Although our analysis could be extended to cover the case in which both the equity and bond returns include random components, our simplification seems defensible for a couple of reasons. First, much of the apparent randomness in historical government bond returns is the result of capital gains and losses faced by bond holders who are assumed to sell their bond portfolios at the end of each year. A bond holder who continues to own a bond until maturity faces far less capital risk than implied by the standard calculations. Since the retirement accounts in our simulations are assumed to hold nearly all bonds to maturity, capital market risk is less relevant. Second, some of the historical risk of holding government bonds has been the result of unanticipated changes in price inflation. The introduction of price-indexed government bonds in the 1990s has largely eliminated this risk.

We assess the implications of random variation in equity returns by comparing the results of 100 replications of the micro- and macro-simulation model described earlier in the paper. The estimates of the mean equity return and standard deviation of equity returns are used to generate random sequences of deviations in the annual return for repeated simulations of the model over the 75-year projection period.[18] Each year's equity return includes a normally distributed random shock, which is assumed to have a standard deviation of 17 percentage points. Our results are based on a sample of 100 sequences of random deviation terms for equity returns.

The potential impact of financial market risk on the total retirement incomes of workers who contribute to individual accounts is empirically large. Workers who contribute to the new accounts over a full career can anticipate receiving IA pensions that represent a large fraction of expected retirement income. By 2050, the weighted average Model 2 couples' annuity, shown in Table 4, has risen to 45 percent of average couple's OASI pension payable under the "feasible benefits" plan. The individual account annuity is risky, however. The risks are modest in 2025 when an immature individual account system would provide an average married couple just 16 percent of OASI pension available under the "feasible benefits" plan. But by 2050, the standard deviation of pension income financed out of the individual account is substantially larger because workers retiring in that year have contributed to the accounts over a full career.

[18] Shiller (1989) and Burtless (2003). We have not modeled the auto-correlation or mean reversion process that may be embedded in annual equity returns. For a discussion of these issues see Poterba and Summers (1988) and Lo (1997).

Tables 5 and 6 compare retirement incomes and real returns under the "feasible benefits" plan and the Commission's Model 2 proposal. As in Tables 1 and 2 we show results for workers who retire in four years – 2000, 2025, 2050, and 2075. Table 5 shows replacement rates provided under the two reform plans; Table 6 shows real internal rates of return on contributions to the reformed pension system. The replacement rates and internal returns shown for the Commission's Model 2 plan include the residual OASI pension plus the annuity payable under the new individual retirement account. (Workers who retire in 2000 do not make contributions to the new accounts, but their lifetime OASI pensions would be slightly reduced under the Commission's Model 2 plan if OASI pensions after 2020 were gradually reduced in order to maintain Paygo balance in the OASDI program.)

We present results showing both the mean value of pensions and the range of pensions around this mean value. The figures in bold show the mean replacement rate or internal rate of return, while figures in italics indicate the first and tenth decile rates when part of a worker's pension is subject to financial market risk. Clearly, the pension is not subject to this kind of risk when it is entirely derived from the traditional OASI program. When part of the pension is derived from an individual investment account, however, the worker's replacement rate and return on contributions will depend on his or her investment portfolio and on the exact sequence of annual returns on the selected portfolio.

Consider the weighted average replacement rate for all married couples reaching the early retirement age in 2025. Results for these couples are displayed in the bottom rows of Table 5. Column 3 shows the replacement rate of couples retiring under the "feasible benefits" plan. The weighted mean replacement rate for the 99 couples is 44 percent. Column 4 shows the range of replacement rates for couples retiring under the Commission's Model 2 plan. The weighted mean replacement rate is 35 percent, while the first and ninth decile replacement rates are 33 percent and 38 percent, respectively.[19] This range of outcomes indicates there is a one-in-ten chance that the weighted replacement rate under the Commission's plan will be greater than 38 percent and a one-in-ten chance it will fall below 33 percent. Note that the first decile, mean,

[19] To calculate the first decile RR, for example, we calculated the first decile RR for each of the 99 simulated couples and computed the weighted average value of these first decile estimates. Recall that our simulation of financial market risk required us to calculate replacement rates using 100 sequences of annual portfolio returns. The identical 100 sequences of returns were used to calculate RRs for the 99 couples.

and ninth decile replacement rates are each well below the mean replacement rate that would be provided by the "feasible benefits" plan. The relative value of the two plans is less clear for married couples reaching the early retirement age in 2075. Our calculations show that the mean replacement rate is somewhat higher under the "feasible benefits" plan (39 percent versus 37 percent for the Commission plan), but the ninth decile replacement rate under the Commission plan is significantly higher than the "feasible benefits" alternative (46 percent versus 39 percent). Bear in mind, however, that couples must eventually pay substantially higher lifetime contributions to obtain their pension benefits under the "feasible benefits" plan, because the contribution rate is capped at 12.4 percent of wages in the Commission's plan. As a result, the internal rate of return on contributions makes the Commission's plan look somewhat better, especially for couples with low lifetime incomes (see Table 6).

As noted earlier, the Commission plan offers relatively more generous treatment of low wage couples compared with high wage couples. In fact, for low-wage couples retiring in 2050 the mean replacement rate is significantly better under the Commission's plan than it is under a "feasible benefits" plan (57 percent versus 52 percent). Even in that year, however, the presence of financial market risk introduces a serious hazard in the retirement incomes available to low-wage couples. For couples who invest half their investment portfolios in stocks and half in bonds, there is a one-in-ten chance that retirement benefits will be 7 percent or more below benefits obtainable under a "feasible benefits" reform plan. If the new pension system is intended to assure workers of retirement incomes that replace a dependable percentage of lifetime wages, the financial risk associated with the individual account may expose some couples – even favored low-wage couples – to undesirable risk. Of course, couples can allocate a larger percentage of their contributions to safe assets, such as government bonds, and a smaller percentage to equities, but this will reduce their expected pension income, possibly well below the pension they could obtain under the "feasible benefits" plan.

Conclusion

This paper evaluates the distributional consequences on married couples of a Social Security reform plan proposed by a presidential Commission. Under our assumption, the existing OASDI system as well as any reforms to that system must be subject to a consistent Paygo standard in which all future benefits must be financed through worker contributions and

the investment earnings on those contributions. Under this assumption, the introduction of individual accounts under the Commission's Model 2 plan must significantly reduce the retirement incomes of most workers who will retire between 2020 and 2040, at least in comparison with a "feasible benefits" plan that preserves the existing system through a balanced combination tax increases and benefit reductions. The build-up of funds in the individual accounts deprives the OASDI program of revenues and forces a deep reduction in traditional benefits. Because workers who retire between 2020 and 2040 will not have an opportunity to contribute to the new system over a full career, the annuities that can be purchased with their individual account balances are too small to offset the OASDI benefit cuts that will be triggered if the OASDI program is subject to a Paygo requirement. The retirement income losses of the generation retiring before 2040 will be partially reversed by income gains of the generations who retire after the individual account system is fully mature. If at least half of balances in the individual accounts are invested in U.S. equities, the individual accounts can be expected eventually to reduce modestly lifetime retirement incomes relative to a baseline that maintains the current system on a Paygo basis. Moreover, since the individual accounts will ultimately provide a large fraction of the typical couple's pension, the new system will introduce a considerable degree of financial risk in retirement income. The reason for smaller retirement incomes under the Commission's plan is that contributions to the retirement system are capped at 12.4 percent of taxable payroll under the plan, whereas contributions eventually rise by 3 percentage points under the "feasible benefits" alternative. Of course, this difference between the two plans means that active workers enjoy higher net incomes while working than they would if Social Security taxes were increased to close part of its funding shortfall.

Finally, we conclude that the Commission's plans would have relatively small effects on the distribution of benefits across income classes within the same generation. From the point of view of married couples, the small effects would generally favor low-income couples at the expense of higher income couples. While reducing pensions under the current program would seem to be a disadvantage to low-income workers, because the benefit formula is tilted in their favor, the Commission's Model 2 plan liberalizes the traditional benefit for low-wage workers with steady wages, it improves pensions for some low-income widows, and it restricts access by high-income workers to the implicit subsidies provided to contributors to individual accounts.

The most striking redistributive impact of the Commission's proposals is to favor generations that will retire in the distant future at the expense of workers retiring between 2020 and 2040.

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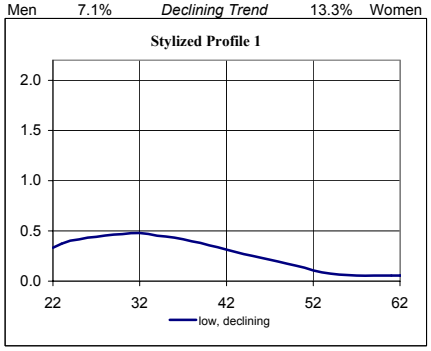
Figure 1. Stylized Age-Earnings Profiles, 1926-1965 birth cohorts (all earnings)

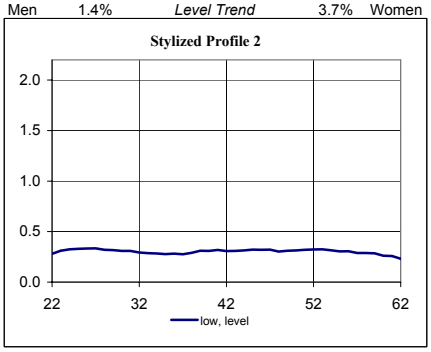
Earnings measured as a percent of economy-wide average earnings

Low Income Level

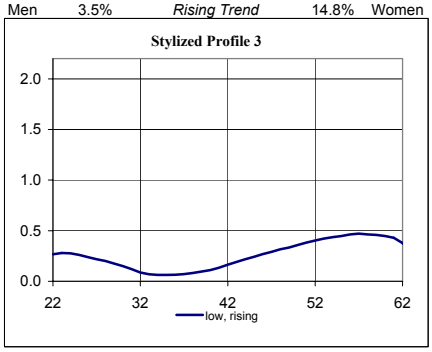
Men 7.1% *Declining Trend* 13.3% Women



Men 1.4% *Level Trend* 3.7% Women

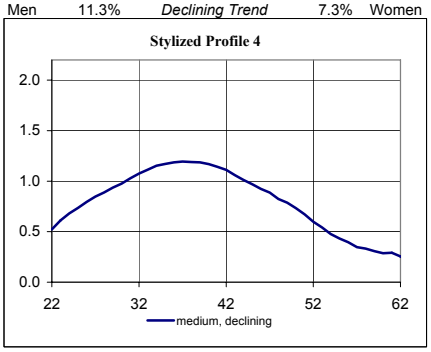


Men 3.5% *Rising Trend* 14.8% Women

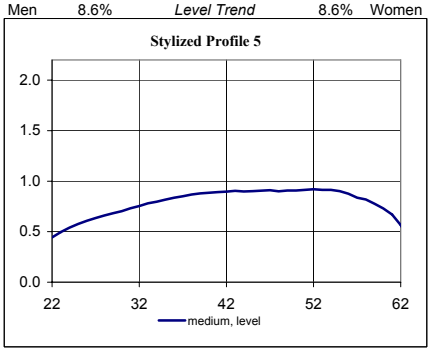


Medium Income Level

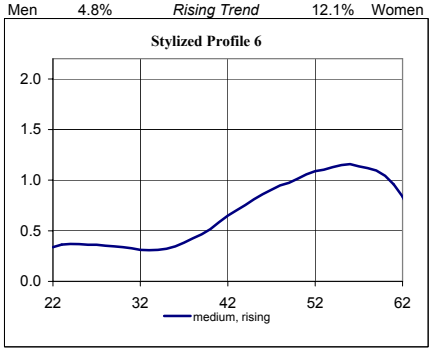
Men 11.3% *Declining Trend* 7.3% Women



Men 8.6% *Level Trend* 8.6% Women

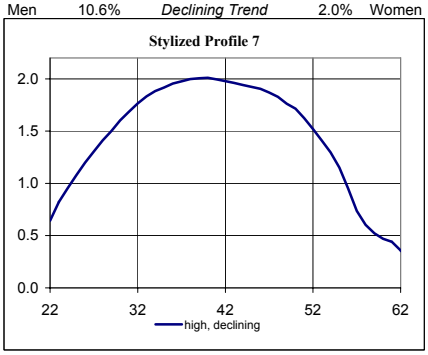


Men 4.8% *Rising Trend* 12.1% Women

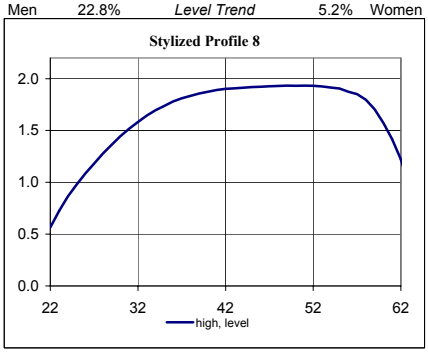


High Income Level

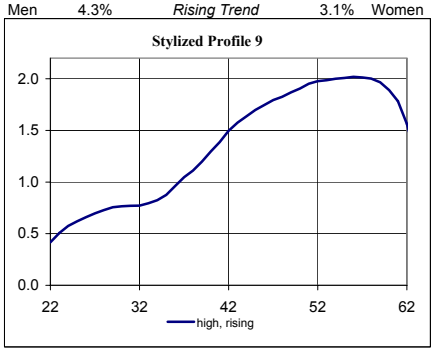
Men 10.6% *Declining Trend* 2.0% Women



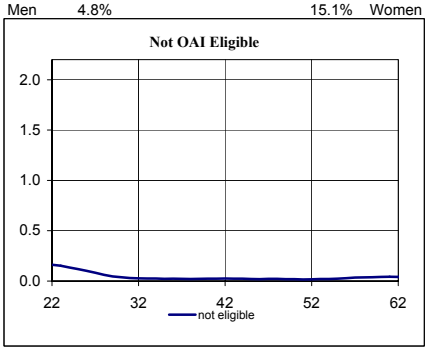
Men 22.8% *Level Trend* 5.2% Women



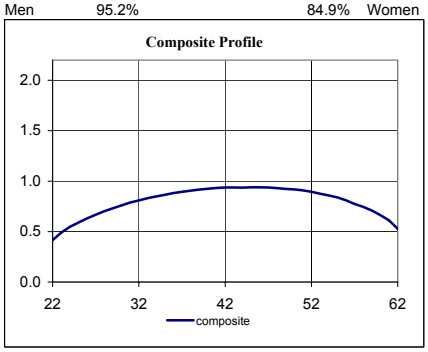
Men 4.3% *Rising Trend* 3.1% Women



Men 4.8% 15.1% Women



Men 95.2% 84.9% Women



Source: Authors' tabulations of matched SIPP-SSER files (1990-1993 SIPP panels).

Figure 2. Required Tax Increases and Benefit Reductions to Maintain OASDI Solvency

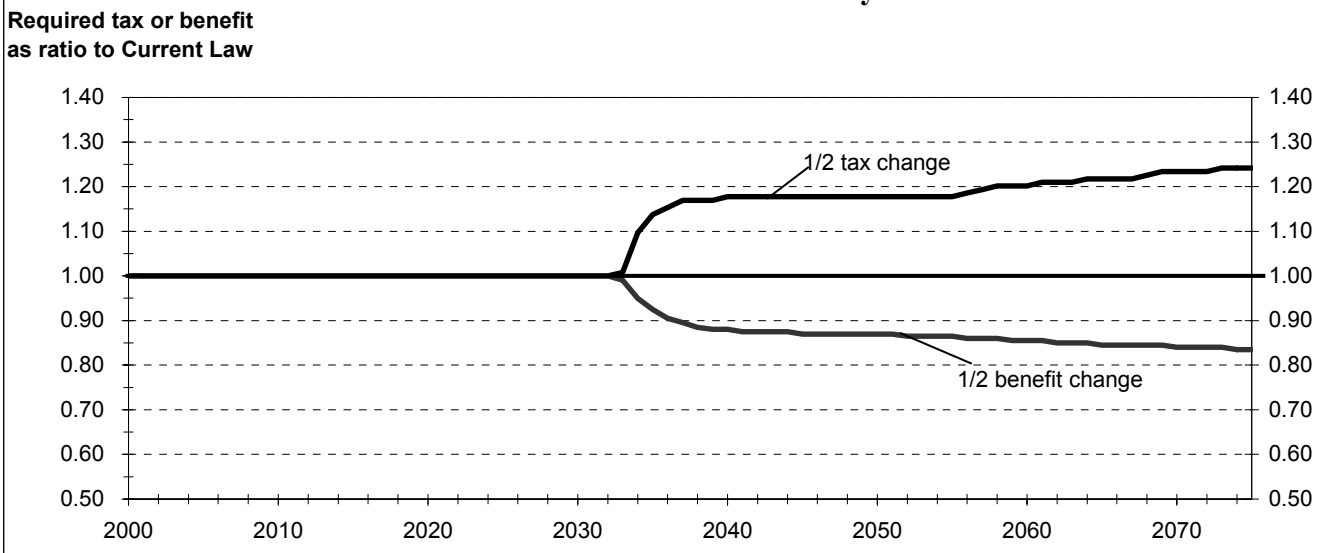


Figure 3. Required Benefit Reductions to Maintain OASDI Solvency in Model 2

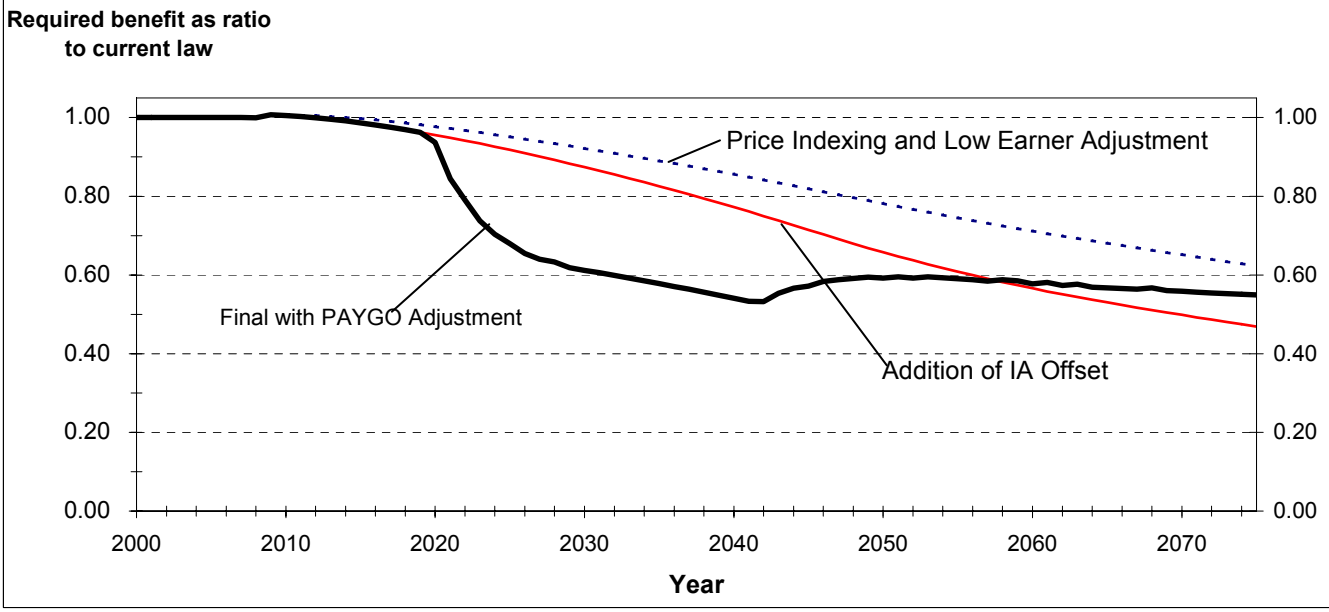


Table 1. Replacement Rates and Internal Rates of Return on Contributions for Individuals and Couples under Current Law, by Year of Retirement

Percent

	2000			2025			2050			2075		
	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR
Individual workers treated as single persons												
Men	103	44	2.6	95	42	2.0	95	41	2.1	95	41	2.1
Women	45	59	3.9	64	51	2.9	64	49	2.9	64	49	2.8
Weighted Average	76	51	3.2	79	47	2.5	79	46	2.6	79	46	2.5
Married couples												
Low Third	83	71	4.2	87	63	3.3	87	61	3.4	87	61	3.5
Medium Third	179	50	3.3	178	44	2.4	178	43	2.5	178	43	2.6
High Third	256	41	2.7	274	36	1.8	274	35	1.9	274	35	2.0
Weighted Average	174	54	3.4	180	48	2.5	180	46	2.6	180	46	2.7

Notes: The replacement rate (RR) is the average annual real lifetime OASI pension divided by the individual's or couple's annual real lifetime wages after subtraction of contributions for OASI. The internal rate of return (IRR) measures the real return on the individual's or couple's lifetime contributions to the OASI program. The calculations ignore Survivors' Insurance pensions received before age 62.

Source: Authors' calculations as explained in text.

Table 2. Replacement Rates and Internal Rates of Return on Contributions for Individuals and Couples under Feasible Benefits Plan, by Year of Retirement

Percent

	2000			2025			2050			2075		
	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR
Individual workers treated as single persons												
Men	103	44	2.6	95	40	1.8	95	36	1.4	95	35	1.1
Women	45	59	3.9	64	47	2.7	64	42	2.3	64	42	2.0
Weighted Average	76	51	3.2	79	43	2.3	79	39	1.8	79	39	1.5
Married couples												
Low Third	83	71	4.2	87	58	3.1	87	52	2.7	87	51	2.4
Medium Third	179	50	3.3	178	41	2.2	178	37	1.8	178	36	1.5
High Third	256	41	2.7	274	33	1.5	274	30	1.1	274	30	0.8
Weighted Average	174	54	3.4	180	44	2.3	180	40	1.9	180	39	1.6

Notes: The replacement rate (RR) is the average annual real lifetime OASI pension divided by the individual's or couple's annual real lifetime wages after subtraction of contributions for OASI. The internal rate of return (IRR) measures the real return on the individual's or couple's lifetime contributions to the OASI program. The calculations ignore Survivors' Insurance pensions received before age 62.

Source: Authors' calculations as explained in text.

Table 3. Replacement Rates and Internal Rates of Return on Contributions for Individuals and Couples under Original Version of Commission's Model 2 Plan, by Year of Retirement

Percent

	2000			2025			2050			2075		
	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR
OASI benefits												
Individual workers treated as single persons												
Men	103	44	2.6	95	33	1.5	95	19	0.4	95	13	-0.7
Women	45	59	3.9	64	41	2.6	64	24	1.7	64	17	0.6
Weighted Average	76	51	3.2	79	37	2.1	79	22	1.1	79	15	0.0
Married couples												
Low Third	83	75	4.3	87	54	3.2	87	32	2.5	87	22	1.6
Medium Third	179	50	3.3	178	33	1.8	178	19	0.7	178	13	-0.3
High Third	256	41	2.7	274	26	1.1	274	15	-0.1	274	10	-1.1
Weighted Average	174	55	3.4	180	38	2.1	180	22	1.1	180	15	0.1
Individual account (IA) benefits												
Individual workers treated as single persons												
Men	103	--	--	95	7	3.3	95	17	3.6	95	17	3.6
Women	45	--	--	64	8	3.8	64	21	3.9	64	20	3.9
Weighted Average	76	--	--	79	8	3.5	79	19	3.8	79	18	3.8
Married couples												
Low Third	83	--	--	87	9	3.5	87	23	3.8	87	23	3.8
Medium Third	179	--	--	178	7	3.5	178	17	3.8	178	16	3.8
High Third	256	--	--	274	5	3.5	274	13	3.8	274	13	3.8
Weighted Average	174	--	--	180	7	3.5	180	18	3.8	180	17	3.8

Notes: The replacement rate (RR) is the average annual real lifetime pension divided by the individual's or couple's annual real lifetime wages after subtraction of contributions for OASI and the IA pension. The internal rate of return (IRR) measures the real return on the individual's or couple's lifetime contributions to the OASI program or IA savings plan. The calculations ignore Survivors' Insurance pensions received before age 62.

Source: Authors' calculations as explained in text.

Table 4. Replacement Rates and Internal Rates of Return on Contributions for Individuals and Couples under PAYGO Version of Commission's Model 2 Plan, by Year of Retirement

Percent

	2000			2025			2050			2075		
	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR	Relative average lifetime earnings	RR	IRR
OASI benefits												
Individual workers treated as single persons												
Men	103	43	2.5	95	24	0.5	95	20	0.5	95	16	0.0
Women	45	56	3.8	64	31	1.7	64	26	1.8	64	20	1.3
Weighted Average	76	49	3.1	79	28	1.1	79	23	1.2	79	18	0.6
Married couples												
Low Third	83	71	4.2	87	41	2.3	87	34	2.7	87	27	2.1
Medium Third	179	48	3.3	178	24	0.9	178	20	0.9	178	16	0.3
High Third	256	39	2.6	274	19	0.2	274	16	0.1	274	13	-0.5
Weighted Average	174	52	3.4	180	28	1.1	180	24	1.2	180	19	0.7
Individual account (IA) benefits												
Individual workers treated as single persons												
Men	103	--	--	95	7	3.3	95	17	3.6	95	17	3.6
Women	45	--	--	64	8	3.8	64	21	3.9	64	20	3.9
Weighted Average	76	--	--	79	8	3.5	79	19	3.8	79	18	3.8
Married couples												
Low Third	83	--	--	87	9	3.5	87	23	3.8	87	23	3.8
Medium Third	179	--	--	178	7	3.5	178	17	3.8	178	16	3.8
High Third	256	--	--	274	5	3.5	274	13	3.8	274	13	3.8
Weighted Average	174	--	--	180	7	3.5	180	18	3.8	180	17	3.8

Notes: The replacement rate (RR) is the average annual real lifetime pension divided by the individual's or couple's annual real lifetime wages after subtraction of contributions for OASI and the IA pension. The internal rate of return (IRR) measures the real return on the individual's or couple's lifetime contributions to the OASI program or IA savings plan. The calculations ignore Survivors' Insurance pensions received before age 62.

Source: Authors' calculations as explained in text.

Table 5. Pension Replacement Rates of Individuals and Couples under Feasible Benefits Plan and PAYGO Version of Commission's Model 2 Plan, by Year of Retirement

Percent of lifetime average after-tax earnings

		2000		2025		2050		2075	
		Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)
Individual workers treated as single persons									
	1st decile				*29*		*30*		*26*
Men	**Mean**	**44**	**43**	**40**	**31**	**36**	**37**	**35**	**33**
	9th decile				*33*		*46*		*42*
	1st decile				*37*		*38*		*33*
Women	**Mean**	**59**	**56**	**47**	**39**	**42**	**46**	**42**	**42**
	9th decile				*42*		*58*		*52*
	1st decile				*33*		*34*		*30*
Weighted Average	**Mean**	**51**	**49**	**43**	**35**	**39**	**42**	**39**	**38**
	9th decile				*38*		*52*		*48*
Married couples									
	1st decile				*47*		*48*		*41*
Low Third	**Mean**	**71**	**71**	**58**	**49**	**52**	**57**	**51**	**51**
	9th decile				*53*		*70*		*63*
	1st decile				*29*		*30*		*26*
Medium Third	**Mean**	**50**	**48**	**41**	**31**	**37**	**36**	**36**	**32**
	9th decile				*33*		*45*		*41*
	1st decile				*23*		*24*		*21*
High Third	**Mean**	**41**	**39**	**33**	**25**	**30**	**29**	**30**	**26**
	9th decile				*27*		*36*		*33*
	1st decile				*33*		*34*		*29*
Weighted Average	**Mean**	**54**	**52**	**44**	**35**	**40**	**41**	**39**	**37**
	9th decile				*38*		*51*		*46*

Notes: The replacement rate (RR) is the average annual real lifetime pension (including IA pension if available) divided by the individual's or couple's annual real lifetime wages after subtraction of contributions for OASI and the IA pension. The calculations ignore Survivors' Insurance pensions received before age 62.
Source: Authors' calculations as explained in text.

Table 6. Internal Rates of Return on Contributions for Individuals and Couples under Feasible Benefits Plan and PAYGO Versions of Commission's Model 2 Plan, by Year of Retirement

Percent per year

		2000		2025		2050		2075	
		Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)	Feasible benefits	Commission plan (PAYGO)
Individual workers treated as single persons									
	1st decile				*0.5*		*0.9*		*0.6*
Men	**Mean**	**2.6**	**2.5**	**1.8**	**0.7**	**1.4**	**1.5**	**1.1**	**1.3**
	9th decile				*1.0*		*2.3*		*2.2*
	1st decile				*1.7*		*2.0*		*1.7*
Women	**Mean**	**3.9**	**3.8**	**2.7**	**1.9**	**2.3**	**2.5**	**2.0**	**2.3**
	9th decile				*2.2*		*3.2*		*3.1*
	1st decile				*1.1*		*1.5*		*1.2*
Weighted Average	**Mean**	**3.2**	**3.1**	**2.3**	**1.3**	**1.8**	**2.0**	**1.5**	**1.8**
	9th decile				*1.6*		*2.8*		*2.7*
Married couples									
	1st decile				*2.3*		*2.6*		*2.3*
Low Third	**Mean**	**4.2**	**4.2**	**3.1**	**2.5**	**2.7**	**3.1**	**2.4**	**2.9**
	9th decile				*2.7*		*3.7*		*3.6*
	1st decile				*0.5*		*0.8*		*0.5*
Medium Third	**Mean**	**3.3**	**3.3**	**2.2**	**0.7**	**1.8**	**1.3**	**1.5**	**1.1**
	9th decile				*0.9*		*2.0*		*1.9*
	1st decile				*-0.1*		*0.3*		*0.0*
High Third	**Mean**	**2.7**	**2.6**	**1.5**	**0.1**	**1.1**	**0.8**	**0.8**	**0.6**
	9th decile				*0.4*		*1.5*		*1.4*
	1st decile				*0.9*		*1.2*		*0.9*
Weighted Average	**Mean**	**3.4**	**3.4**	**2.3**	**1.1**	**1.9**	**1.7**	**1.6**	**1.6**
	9th decile				*1.3*		*2.4*		*2.3*

Notes : The internal rate of return (IRR) measures the real return on the individual's or couple's lifetime contributions to the pension system (including OASI contributions and contributions to IA savings plan, if relevant). The calculations ignore Survivors' Insurance pensions received before age 62.

Source: Authors' calculations as explained in text.