Social Security Reform: The United States in 2002

Andrew A. Samwick

Introduction

When policy discussions in the United States turn to domestic issues, the focus is often on Social Security and Medicare and the precarious position of their finances. While Social Security's long-term solvency has been an ongoing concern for over twenty-five years, it was only with the report of the 1994-1996 Advisory Council on Social Security that policy discussions formally included serious proposals to prefund future liabilities with private securities.[1] These discussions were abetted by the unexpected appearance of surpluses in the federal government's budget forecasts during the late 1990s.

During the past five years, several other policy proposals have been advanced to address the projected imbalances between revenues and expenditures.[2] In addition, the two main candidates in the 2000 presidential elections made Social Security reform a central feature of their campaigns, and shortly after the inauguration of George W. Bush, a presidential commission on Social Security was established. The commission's final report discusses three reform options that would involve the use of personal retirement accounts (PRAs) to prefund a portion of future benefits.[3] The report generated a substantial media reaction at the time, but it has not served as the basis for substantive legislative action or even further national discussions.

Despite all the attention, the United States is disappointingly far from a meaningful resolution to the financial crisis in its entitlement programs. The purpose of this paper is to discuss both the magnitude of the financial crisis facing Social Security and the economic and political elements of a solution. Numerical simulations of possible transition paths to a partially funded system are used to illustrate the contribution that PRAs can play in restoring solvency.

The financial problem

Although the Social Security program in the United States is operated on a largely pay-as-you-go basis, the financial condition of the program is discussed with regard to the trust funds out of which benefit payments are made. Every spring, the Trustees of the Social Security and Medicare trust funds report on current status and projected condition of those funds over the next 75 years. In the 2002 Annual Report (hereafter, Trustees Report 2002), the trust fund ratio for the Old Age, Survivors, and Disability Insurance (OASDI) programs was 261 percent for 2002.[4] Unlike the reforms enacted in 1983, the present crisis is not due to an inability to pay benefits immediately.

When the Trustees Report is released, the reaction in the popular press focuses on the date at which the trust funds are projected to go to zero. In Trustees Report 2002, this date was 2041, and this was reported as good news because the prior year's report put that date at 2038.[5] In the Clinton administration, and in the Gore presidential campaign that followed, proposals for improving the solvency of Social Security consisted of infusions of cash to postpone the date of trust fund exhaustion into the 2050s.[6]

There are two problems with the date of TF exhaustion as a measure of solvency. The first is that it is by no means clear that the trust fund ratio is an economically meaningful concept. The balance in the trust fund represents the current value of the extent to which Social Security revenues have been used by the government for any purpose *other* than paying Social Security benefits. If that purpose was to reduce the stock of debt held by the public, then the trust fund does represent a claim on real assets—drawing down the trust fund simply involves selling the debt back to the public so that, when the trust fund is exhausted, the amount of debt held by the public is the same as it would have been had there not been Social Security surpluses. The question of whether there is or is not a trust fund boils down to whether the presence of the Social Security surplus induced the government to run larger budget deficits in the non-Social-Security part of the budget. I regard this as an unresolved, and potentially irresolvable, question of political economy.[7]

The second, and more important, problem with focusing on the date of trust fund exhaustion is that it is independent of how dire the fiscal situation becomes after the trust fund hits zero. In 2041, for example, the gap between the income and cost rates on the Social Security program is forecast to be 4.49 percent of payroll (or 36 percent of the revenues collected by the payroll tax). As a means of providing a more

comprehensive summary of the finances of the program, the Trustees Report also provides the 75-year actuarial deficit of the programs. This actuarial deficit is the percentage (of taxable payroll) that could be added to the income rate for each of the next 75 years, or subtracted from the cost rate for each year, to leave the trust fund with one year's worth of benefits at the end of the 75-year period. In Trustees Report 2002, this 75-year actuarial deficit was 1.87 percent of payroll using the intermediate assumptions.

The 75-year actuarial deficit is the most widely used measure of the system's solvency, particularly by proponents of reform who wish to preserve the defined benefit structure of the program. For example, in an influential book, Aaron and Reischauer (2001) provide a recipe of changes to the system that, when evaluated over the 75-year period, reduce the 75-year actuarial deficit to zero without using general revenue transfers or PRAs.[8] They do not explicitly discuss what happens after the 75-year horizon, but a simple graph of the income and cost rates over that time period makes the shortcoming quite clear.

Figure 1 graphs the single-year projections of the income and cost rates provided in Trustees Report 2002, along with the actuarial balances on Social Security and Medicare.[9] The relatively flat line indicated by (purple) diamonds is the forecasted income rate. The income rate reflects revenue received by the OASDI trust funds due to the payroll tax of 12.4 percent and the income tax on current benefits. Income taxation on benefits currently generates an amount equal to 0.33 percent of taxable payroll, making the income rate 12.73 percent in 2002. The income thresholds at which benefits become taxable are not indexed for inflation. As a result, in 2080, income taxation of benefits will generate 1.03 percent of payroll, resulting in an income rate of 13.43 percent.

The curve indicated by (red) squares represents the cost rate or payments made by the Social Security system to beneficiaries. The cost rate in 2002 is 10.84 percent of payroll, generating the $12.73 - 10.84 = 1.89$ percent annual balance in the program (reported as 1.88 in Trustees Report 2002 due to rounding). The annual balance is graphed at the bottom and is indicated by (green) triangles. Over time, the cost rate increases substantially, reaching a value of 20.11 percent of payroll in 2080. The annual balance in that year will be $13.43 - 20.11 = -6.68$ percent of payroll. Unless the Social Security system is reformed before that time, the payroll tax would have to rise from 12.40 percent to 19.08 percent to pay all benefits promised in current law. Such an increase represents an expansion of the program by over 50 percent.[10]

The growing financial imbalance in Social Security is the result of three factors that have become critically important over the last quarter

century: lower productivity growth, lower fertility, and lower mortality.[11] To see just how important demographic changes in particular are, note that the support ratio of workers to retirees is 3.3 in 2002, which is 83 percent higher than the projected ratio of 1.8 in 2080.[12] Between 2002 and 2080, the cost rate (net of the income taxation of benefits) is projected to rise from 10.51 percent to 19.08 percent, an increase of 81 percent.

A very different picture therefore emerges when we consider the financial problem as a long-term steady state, rather than a long-term average. As Trustees Report 2002 notes, the 1.87 percent average is only 28 percent of the 6.68 percent gap in the last year. A uniform increase in the income rate of 1.87 percentage points leaves the Trust Fund positive (at one year's worth of benefits, or about 20 percent of taxable payroll) but rapidly declining. At the very least, the standard for restoring solvency to the program should be to have not only a positive trust fund in the terminal year, but also a positive and *non-decreasing* trust fund.

The nature and magnitude of a prefunded solution

Solvency can be restored within the pay-as-you-go structure of the existing program by increasing tax revenues or cutting benefit payments to cover the long-term annual deficits. Alternatively, the system could be expanded to prefund a portion of the promised benefits, using the income flow off of the accumulated assets to bridge the gap between the annual income and cost rates.

Using the 6.68 percent deficit in 2080 as a guide, some simple arithmetic can indicate the amount of prefunding that is required. Suppose that investments in a portfolio of stocks and bonds earn a 5.5 percent expected real return.[13] To obtain an income flow of 6.68 percent of taxable payroll requires a stock of assets equal to 6.68/5.5 = 121 percent of taxable payroll. In 2080, taxable payroll is projected to be 35 percent of GDP, so that the stock of assets would be 0.35 x 121 = 42.5 percent of GDP. If such a fund existed in 2002, when GDP is forecast to be $10.197 trillion,[14] the fund would be $4.33 trillion.

To put this figure in some perspective, as of June 2002, the net assets of all mutual funds in the United States was $6.63 trillion.[15] The notion that a stock of this magnitude, or any nontrivial fraction of this magnitude (like two thirds), could be administered centrally without political interference and without disruption to the capital markets is unrealistic. While many authors have made a case against personal retirement accounts, sometimes in comparison to a centrally managed fund, none have done so in the context of a plan that provides an alternative

means of addressing the entire financial shortfall, i.e. leaving the trust fund not only positive but also non-decreasing in the last year of the projections.[16]

       This calculation shows that, in the absence of benefit cuts or tax increases that no opponent of PRAs has proposed, PRAs are an essential component of restoring solvency to Social Security. The costs of administering a decentralized system are obviously higher than of a centralized system, but in light of the magnitude of the financial imbalance, these costs are but a necessary evil in the process of reform.[17]

Feasible transition paths

There are many ways to restore long-term solvency to Social Security based on a system of PRAs. A feasible transition path to a solvent system is defined by the way in which several questions are answered. What is the rule that specifies how the pay-as-you-go benefits will be reduced? How large will the contributions to PRAs be? How will PRA benefits be accumulated and distributed? What is the source of financing for the combined contributions to the pay-as-you-go and PRA systems?

       Martin Feldstein and I have written several papers that provide a variety of different specifications of transition paths.[18] We have updated our basic "Two Percent Plan" over the years to be consistent with changes in the economic and demographic assumptions in the Trustees Reports and to adapt the same basic idea to the evolving policy debate on Social Security reform. At present, the guiding principles established for the recent presidential commission give a good indication of the political requirements for reform.

       In Feldstein and Samwick (2002), we describe a plan that attempts to meet these requirements. That plan: 1) Pays full benefits to those near retirement; 2) Fully protects the Disability Insurance program; 3) Does not increase the statutory payroll tax rate; 4) Provides expected retirement benefits (from the PRAs and the scaled down pay-as-you-go system) that are at least as high as those promised in current law for each cohort; and 5) Allows for pre-retirement bequests of PRA balances and 10-year certain annuity payments. We discuss the degree of financial risk borne by retirees due to the investment of PRAs in private securities and provide a menu of different financing mechanisms for the transition.

       Rather than repeating that analysis here, I refer the reader to that paper for the simulation results and to the Appendix below for an overview of the simulation model. I use the simulation model here to illustrate a straightforward transition path. The simulation begins with PRA

contributions of 2.7 percent of payroll each year starting in 2003. The PRA balances are assumed to accumulate at a 5.5 percent expected real return. If the worker dies before reaching the normal retirement age, the balance in the PRA can be bequeathed. If the worker becomes disabled before retiring, full disability insurance payments are made from the pay-as-you-go system for the period of disability.[19] At the normal retirement age, the PRA purchases a variable annuity with a 10-year certain feature, meaning that benefits continue for 10 years even if the beneficiary dies during that time period.[20]

The benefits being paid from the PRAs permit the pay-as-you-go benefits to be reduced. In this simulation, pay-as-you-go benefits are reduced by 75 percent of the PRA annuity, as in Feldstein and Samwick (1998a). If this is implemented as an ex ante reduction in benefits based on the expected PRA annuity for a standard portfolio, then all of the financial risk remains with the annuitant. If it is based on the ex post performance of that portfolio, then the government shares in the financial risk of the PRAs. These reductions in the pay-as-you-go benefits are what restore Social Security to solvency. That the particular choice of parameters in this simulation is sufficient to restore solvency is shown in Figure 2. The (green) triangles indicate the trust fund path for this system of PRAs. The trust fund is never exhausted, and it is increasing after 2053.[21]

Table 1 presents the time-series of aggregate contributions, benefits, and account balances associated with this transition path. All dollar amounts are in billions of 2002 dollars, and all percentages are relative to aggregate taxable payroll. The first column shows the aggregate contributions to PRAs. This is simply 2.7 percent of taxable payroll in each year. The next two columns show the aggregate amounts of withdrawals in the form of annuities (excluding the 10-year certain component). These amounts grow rapidly as the system is phased in, reflecting the increasing number of years that retirees have had to accumulate their funds as well as increasing payrolls on which contributions have been made. By 2080, PRA annuities are 9.1 percent of taxable payroll. Three-fourths of this amount are being used to offset payments that would otherwise have to be made out of the pay-as-you-go system. The last two columns show the aggregate balances in the PRAs. Within 30 years, balances are equal to taxable payroll, and within 50 years, they are twice taxable payroll.

Table 2 presents the expected per capita annuities from the PRAs and the remaining pay-as-you-go system for cohorts of workers who reach their normal retirement ages in select years. The first column shows the per capita benefits as specified in current law.[22] They grow over time due to the increase in the real wage level. The second column shows the expected

PRA annuities. They grow over time due to real wage growth and due to the phase-in of the system. The third column shows the pay-as-you-go benefits after they have been reduced by 75 percent of the expected PRA annuities. In the early years, this reduction is negligible, but by 2080, it represents more than half of the benefits specified in current law. Adding the second and third columns, and dividing by the first, yields the percent gain relative to current law, shown in the fourth column. After about 40 years, the PRAs are sufficiently large to allow a modest 10 percent increase in expected retirement income, and by 2080, expected retirement income is one sixth higher than under current law.

As noted above, the PRAs are invested in a portfolio of stocks and bonds, which are subject to uncertainty in their rates of return. The stochastic simulations in Feldstein and Ranguelova (2001) can be used to examine the lower tail of the distribution of outcomes for transition paths of this type, as in Feldstein and Samwick (2001). Consider the worker who reaches the normal retirement age in 2080, for whom the pay-as-you-go benefits are only half of their current law projected value. Consider the benefits payable at age 77, which is 10 years after the normal retirement age and roughly the middle of expected retirement years. For this worker, there is a 2 percent probability that the annuity payable from the PRA will be less than 10 percent of the benefits specified in current law, resulting in a combined retirement income that is less than 60 percent of the current law benchmark. Similarly, there is a 20 percent probability that the combined retirement income will be less than 80 percent of the current law benchmark, and a 28 percent probability that it will be less than 90 percent of the benchmark.[23]

The presidential commission

The simulated transition path in the preceding section illustrates the role that PRAs can play in restoring solvency to Social Security. The recently convened presidential commission produced three options for reform that relied to varying degrees on prefunding future benefits through PRAs. Two of the options also proposed specific cuts to the pay-as-you-go benefits that would substantially improve the long-term actuarial imbalance.

However, the commission's report failed to establish a direct, causal link between the magnitude of the financial imbalance and the need for PRAs. Rather than demonstrate, as above, that restoring solvency to the system is infeasible without PRAs, the commission based its report on the assertion that Social Security would simply be strengthened if it were

designed to include PRAs. Quoting from the executive summary to the commission's final report:[24]

> To bring the Social Security system to a path of fiscal sustainability—an essential task for any reform plan—there are differing approaches. The Commission believes that no matter which approach is taken, personal accounts can increase expected benefits to future participants in the Social Security system.

The Commission listed several reasons why PRAs should be a part of a reformed Social Security system. None of these rationales are compelling. For example, the report states that a system of PRAs would "facilitate wealth creation." In the United States, there are many tax-advantaged opportunities to save, including defined contribution pension plans, individual retirement accounts, and Keogh plans for the self-employed. To the extent that some members of the population do not have access to these savings vehicles, providing them with access justifies nothing more than the Clinton administration's proposal of Universal Savings Accounts that would subsidize contributions of low-income workers as a supplement to Social Security. Facilitating wealth creation for those who want to save does not have anything to do with eliminating the projected shortfalls in Social Security per se.

The commission also argues in favor of PRAs because they provide "assets that [they own and] can be inherited." While this is a true statement about PRAs, it is unrelated (at best) to restoring the long-term solvency of the system. Social Security provides insurance against the risk of poverty caused by living into old age. Social Security provides critical relief from poverty, especially among surviving spouses and the oldest old.[25] According to the Social Security Administration (2000b, Table VI.A.2), 59 percent of households 65 or older received a majority of their income from Social Security. For the bottom 40 percent of the income distribution, this proportion exceeds 80 percent. Bequests are exactly the opposite type of payment, and, as shown in the simulations above, diverting some funds into bequests serves to reduce the benefits that would otherwise be available to those most in need of annuity income.

The commission also claims that, "Strengthening Social Security through personal accounts can add valuable protections for widows, divorced persons, low-income households and other Americans at risk of poverty in old age." The critical word here is "can," which makes the assertion vacuous, because *any* reform that increased benefits for these groups would better protect them against poverty. It hardly seems reasonable to assert that this protection is better offered through PRAs.

The existing system already targets these groups for higher than average replacement rates. It would be much more efficient to simply enhance these existing benefits, rather than establishing a new system of PRAs for every worker and beneficiary without regard to need, to help these targeted groups. In fact, the some of the commission's reform options make changes to the distribution of benefits within the remaining pay-as-you-go portion of Social Security that disproportionately benefit low-income workers.

Opponents of PRAs have been swift and severe in their criticisms of the commission's report.[26] These critics have gained the upper hand in the policy debate, largely because the commission relied on weak justifications for PRAs and did not make a strong case for their essential role in restoring solvency as the only viable means of prefunding the gap between future income and cost rates of the system. And because the critics do not hold themselves to the appropriate standard of restoring a positive *and* growing trust fund in the last year of the forecast period, they can provide piecemeal solutions to close the 75-year average deficit that appear like equal contenders to proposals that actually meet the more sensible definition of long-term solvency. This state of affairs is a recipe for continued inaction in policy circles.

Moving forward

It is something of an understatement to say that the American public is very distrustful of its elected officials. As a result, the public tends to rally around anyone who can deliver a message, even if it is bad news, in a simple and straightforward manner. So finding a way out of the current morass requires a better delivery than has been employed to date by the administration or its commission.

As noted above, the dramatic increase in the cost rate over the next 80 years is mainly due to the decrease in the support ratio. The decrease in the support ratio is due in part to lower fertility rates and in part to lower mortality rates. There is probably no way to link a reform of the system to fertility, but basing the solution on a link to mortality rates is quite feasible. The signs of increased longevity are ubiquitous, and the improvements are easy to quantify. For example, the Trustees Report 2002 projections are based on life tables (Table V.A4) that show an increase of 4.5 years in life expectancy at age 65 between 2002 and 2080. This is good news, and it should be discussed as such, apart from what it does to Social Security's finances.

Failing to index the normal and early retirement ages to life expectancy implies an increasing portion of adulthood spent collecting benefits. Policy makers could craft a sensible justification for raising these ages. Some plans have already done this—the Aaron and Reischauer (2001) plan and the third option offered by the presidential commission are two prominent examples. Consider how much easier it is to explain why retirement ages have to increase than it is to make sense of, say, a switch from wage indexing to price indexing in the calculation of the benefits, which is the centerpiece of the second option offered by the presidential commission.

Having observed the nature of the debate in the United States for several years, I am skeptical that any means of cutting future benefits would be as easy to motivate as raising the retirement ages. Across the board increases in payroll taxes and decreases in annual benefit amounts are also part of an optimal response to the declining support ratio in a life cycle model, but to a layperson, they are simply less tangibly related to the underlying cause of the financial imbalance.

A rough calculation suggests that the normal retirement age would have to increase to 73 by 2080 in order to restore solvency using only this policy lever. Though it seems to be a large change, it can be phased-in at a rate of about a year per decade. When fully phased in, a worker who wished to retire at the currently legislated normal retirement age of 67 would face actuarial reductions of about 40 percent of benefits (e.g., the current early retirement reduction factor of 6 2/3 percent per year for 6 years). These reductions are of comparable size to those simulated above for a transition path based on a benefit offset or on a direct benefit cut, as in Feldstein and Samwick (2002), and so the results there are applicable here as well.

Where the higher retirement age would really hit hard is at the early retirement age. If left unchanged at 62, then actuarial reductions would be substantial, and those who claimed benefits early would increase their risks of poverty in old age. Perhaps a better solution would be to raise the early retirement age as well and devote more resources to screening workers between age 62 and the new early retirement age for disability payments.[27]

Conclusion

In the United States, the short-term outlook for Social Security shows surpluses for at least another decade. But once the leading edge of the Baby Boom generation switches from paying into the system to drawing

benefits from the system, Social Security will embark on a path to annual deficits that are some 50 percent of revenues. Unfortunately, there is at present no broad agreement about the way reform should occur, and recent attempts to provide a foundation for a national consensus have degenerated into political maneuvering.

Appendix: The Social Security Simulation Model

The estimates presented in this paper use an accounting model developed in the course of ongoing research on Social Security reform with Martin Feldstein.[28] This simplified model is calibrated so that with the current Social Security rules it closely approximates the basic time series of benefits, revenues, and trust fund assets predicted in Trustees Report 2002.

The unit of analysis in the simulations is the individual. Benefits for spouses and survivors are subsumed in the individual benefit projections and the tabulations in Table 2. Benefits paid by the Disability Insurance trust fund are treated separately. After the DI trust fund goes to zero, all DI benefits are paid out of the payroll tax before any OASI benefits are paid. We incorporate the actual current age structure of the population as well as Census Bureau projections of the population through the year 2100.

The simulations simplify by assuming that individuals enter the labor force at age 21 and work until they reach their legislated Social Security normal retirement age (or death if that occurs sooner). Since not everyone in the population actually works during those years, we adjust the labor force participation rate to obtain the number of covered workers in each year specified in the Social Security Administration projections.

We use the historic data for taxable payroll in years before 2002 and follow the intermediate assumption in Trustees Report 2002 that the average real wage rises at 1.1 percent per year in the long-term. The movements in the average real wage are assumed to reflect changes in the age structure of the labor force and differences among age groups in the rate of increase of wages as well as the overall rate of increase of age specific wage rates.

As in Feldstein, Ranguelova, and Samwick (2001), the investments in the Personal Retirement Accounts are assumed to earn a real after-inflation rate of return of 5.5 percent. From 1946 – 1995, the average log return on a portfolio that was 60 percent in the Standard and Poor's 500 portfolio and 40 percent in a broad index of corporate bonds was 5.9 percent. (Including the more recent period would increase this rate of

return.) These portfolio shares approximate the capital structure of the
corporate sector over the postwar period.

Forty basis points are deducted to allow for administrative costs.
This is approximately twice the fee charged in indexed equity funds by
large mutual fund companies and is about the same as the fee charged by
TIAA-CREF on its variable annuity equity fund. Bond funds generally
have even lower administrative charges. The 5.9 percent return is net of the
payment of corporate income and property taxes. Poterba (1998) estimates
that the pretax return on capital in the nonfinancial corporate sector
averaged 8.5 percent over the 1959 – 1996 period. In some simulations in
Feldstein and Samwick (2002), we incorporate the taxes collected on
incremental capital but not included in the return earned on PRA accounts
as an additional source of financing. We follow the Social Security
Trustees in assuming that the real return on the Social Security trust fund
will decline gradually from the current level to a 3.0 percent real interest
rate in the future.

Because we are interested primarily in total benefit payments and
not in their distribution by income and family type, we base our
calculations on taxable payroll in each year and do not distinguish income
levels or family structures. Although we therefore cannot apply the actual
Social Security benefit rules, we can calculate aggregate average benefits
by attributing an implicit rate of return on the taxes paid by individuals in
each birth cohort. Our estimates are modifications of the estimates
originally developed by Boskin et al. (1987) for birth cohorts spaced fifteen
years apart between 1915 and 1990. Our cohort specific rates of return are
estimated in a way that minimizes the sum of the annual squared deviations
of our projected cost rates from those of the Trustees Report 2002 (see
Figure 1).

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[1] Though unable to agree on a single proposal to resolve the crisis, three subgroups
of members of the Council devised plans with varying degrees of benefit cuts, tax
increases, and investments in stocks and bonds. Two of the plans explicitly called
for a system of individual accounts to be established. The Advisory Council's
report is available at: http://www.ssa.gov/history/reports/adcouncil/report/toc.htm.
[2] See Weaver (1999) for a systematic comparison of reform proposals that were
under discussion around the time of the most optimistic budget forecasts.
[3] The commission was convened on May 2, 2001, and delivered its final report on
December 21, 2001. Its report is available at: http://www.csss.gov.
[4] See Table IV.B3 in the Trustees Report 2002. The trust fund ratio is defined as
the proportion of a year's benefit payments that could be paid with the funds
available at the beginning of the year.

[5] See, for example, Pear (2002).

[6] See Page and Ullman (2000) for a description of Gore's proposal.

[7] See Elmendorf and Liebman (2000) and Diamond (2000) for more detailed discussions.

[8] See Table 6-1 on page 103 of Aaron and Reischauer (2001).

[9] These figures can be found in tables IV.B1, IV.B7, and VI.E2 of Trustees Report 2002.

[10] It is common in public discussions to associate the financial crisis in Social Security with the approaching retirement of the Baby Boom generation. However, the problem is more fundamental than the aging of an unusually large birth cohort. In 2080, even the youngest Baby Boomer will be 116 years old. Almost all benefits in that year will be paid to retirees who were born after the Baby Boom generation. Therefore, even if no Baby Boomer pays another dollar in taxes or receives a dollar in benefits, the -6.68 percent annual gap in 2080 would be only trivially smaller. The retirement of the Baby Boom does have an important impact on the system's finances, and this can be seen clearly in Figure 1. The period of rapid increase in the cost rate (and decline in the annual balance) occurs during the two decades starting in 2010 when the Baby Boom generation begins to retire. The annual balance over that period deteriorates by over 5 percentage points of payroll, but note that it does not improve over the remainder of the period shown in the figure. The retirement of the Baby Boom generation does not cause the financial crisis; it simply makes the long-term problem appear sooner rather than later.

[11] The last curve on the graph, shown by (blue) x's, represents the annual actuarial balance in Medicare. The deterioration in its financial condition is more pronounced than with Social Security, largely because it is subject to these three factors plus the positive real growth in the cost of medical services. While the deficits in 2080 are of comparable size in the two programs, the Medicare shortfall occurs relative to a 2.90 percent payroll tax (on a somewhat larger base), rather than a 12.40 percent payroll tax.

[12] See Table IV.B2 in Trustees Report 2002.

[13] As noted in the Appendix, in prior work (e.g., Feldstein, Ranguelova, and Samwick (2001)), this assumption is based on the average postwar real return on a portfolio of corporate stocks and bonds in the United States, with portfolio weights of 60 percent in stock and 40 percent in bonds to approximate the financing mix of the corporate sector over that period, net of a 40 basis point charge for administrative costs. Concerns that the equity market is overvalued, or that the postwar period was simply a high realization of ex post returns from a less favorable distribution, might suggest a lower expected rate of return. See, for example, the papers by John Campbell, Peter Diamond, and John Shoven in Social Security Advisory Board (2001). For the purpose of this calculation, however, choosing a lower rate of return would only strengthen the point.

[14] These figures are reported in Tables VI.E6 and VI.E7 of Trustees Report 2002.

[15] This figure is reported in Investment Company Institute (2002) and includes $4.43 trillion in stock, hybrid, taxable bond, and municipal bond funds and $2.20 trillion in taxable and tax-free money market funds.

[16] See, for example, Munnell (1999).

[17] See Samwick (1999), and the references cited therein, for a more detailed discussion of administrative costs and redistribution in a system of PRAs.

[18] All of our papers are available at http://www.dartmouth.edu/~samwick or as NBER working papers at http://www.nber.org/papers/.

[19] As discussed in the appendix, the DI system is protected in that, once the DI trust fund is exhausted, payments to disabled workers are covered by the payroll tax before any OASI benefits are paid. At the normal retirement age, workers formerly on DI experience the same cuts in pay-as-you-go benefits, which in this case are 75 percent of the expected accumulation if they had worked a full career. A small redistributive tax on PRA balances could be used to alleviate this disproportionate burden on formerly disabled workers.

[20] The 10-year certain annuity is very popular in private annuity markets. As noted in Feldstein and Ranguelova (2001), allowing for pre-retirement bequests and a 10-year certain annuity increase the costs of providing benefits by 19 percent. This is modeled in the simulation by reducing the amount of PRA contributions that go to fund the traditional annuity by 19 percent.

[21] This trust fund path can be contrasted with two other scenarios discussed above. The (blue) diamonds indicate the path of the trust fund under current law. It starts at a value of 28.33 percent of taxable payroll in 2002, peaks at a value of about 60 percent in 2020, and then declines to zero after 2041. The (red) squares indicate the path the trust fund would take if the income rate were increased by 1.87 percent of taxable payroll in 2002. The trust fund peaks higher (at 109 percent) and later (in 2028), and declines to a value of about 20 percent in the 75th year of the forecast period. But it falls rapidly to zero by 2080, when the annual actuarial deficit is over 4.8 percent of payroll (i.e., the 6.68 annual gap less the 1.87 percent in new financing) .

[22] As discussed in the Appendix, the simulations do not distinguish between the types of benefits or beneficiaries. These per capita benefits (and beneficiaries) pertain to all payments from the OASI trust fund (and the recipients).

[23] To the extent that these probabilities of low outcomes are unacceptably high, the most straightforward way to reduce them is to invest the PRA in a less risky portfolio. For example, a transition path that is otherwise the same but invested in inflation-protected bonds, which currently yield 3.5 percent, could restore solvency with a contribution rate of 3.7 percent of payroll and a 100 percent reduction of PRA annuities against pay-as-you go benefits.

[24] All of the quotes from the commission's report in this section are taken from its executive summary on page 11.

[25] Social Security Administration (2000a) reports that among persons aged 65 or older, 8 percent of married households are below 125 percent of the poverty line, compared to 24 percent of nonmarried men and 29 percent of nonmarried women.

By age, 12 percent of households aged 65-69 are below 125 percent of the poverty line, compared to 26 percent of households aged 85 or older.

[26] As a specific example, see Diamond and Orszag (2002). Other critiques can be found in the numerous papers and issue briefs posted to the Social Security Network's website, http://www.socsec.org/facts/index.htm. For a discussion of the commission's report by two of its members, see Cogan and Mitchell (2002).

[27] Gustman and Steinmeier (2002) estimate that approximately 60 percent of the workers who now retire at 62 would shift their retirement ages to a new early retirement age of 64. They also note that under the current system, the flow of new entrants into the DI program at ages 60 and 61 is not large, suggesting that the added burden on the DI screening process would not be too large if the early retirement age were increased.

[28] The economic and demographic aspects of the model were developed originally in Feldstein and Samwick (1997, 1998b). Feldstein and Ranguelova (2001) and Feldstein, Ranguelova, and Samwick (2001) extend the basic model to allow for uncertainty in financial market returns in the PRAs.

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Table 1
Aggregate PRA Deposits, Balances, and Annuities

	PRA Deposits	PRA Annuities		PRA Balances	
Year	$ billion	$ billion	% Payroll	$ billion	% Payroll
2003	119	0	0.0	119	2.7
2010	138	3	0.1	1,235	24.2
2020	160	31	0.5	3,784	63.8
2030	184	112	1.6	7,528	110.5
2040	213	255	3.2	12,215	155.0
2050	244	462	5.1	17,606	194.8
2060	278	726	7.1	22,953	222.9
2070	316	931	8.0	28,363	242.5
2080	358	1,201	9.1	33,940	256.3

Note: All dollar amounts are in constant 2002 dollars.

Table 2
Per Capita Benefits By Year Obtaining Normal Retirement Age

Year	Current Law PAYGO $	Expected PRA Annuities $	PAYGO After Reduction $	Gain Relative to Current Law %	PRA Balance at Retirement $
2003	10,260	0	10,260	0.0	0
2010	11,710	340	11,460	0.7	4,000
2020	13,250	1,290	12,280	2.4	15,670
2030	15,210	3,300	12,730	5.4	39,060
2040	16,260	6,160	11,640	9.5	78,880
2050	18,470	9,470	11,370	12.8	126,180
2060	21,350	11,320	12,870	13.2	145,640
2070	23,380	13,080	13,570	14.0	193,580
2080	25,180	16,760	12,610	16.6	252,470

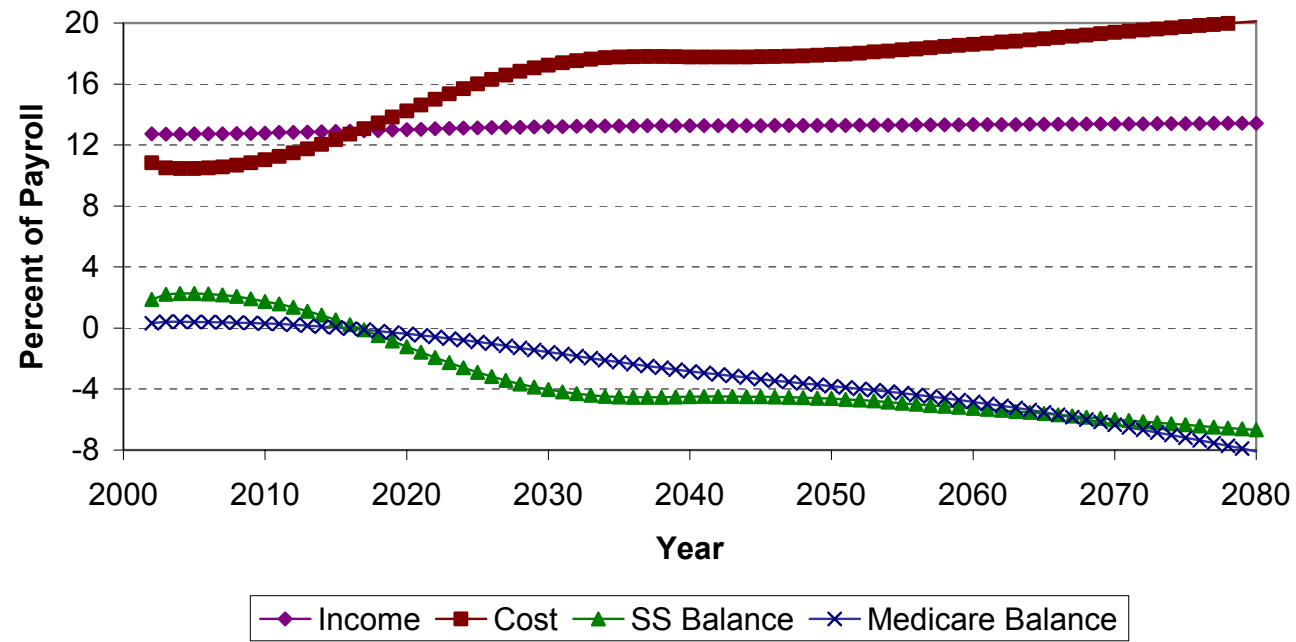Note: All dollar amounts are in constant 2002 dollars.

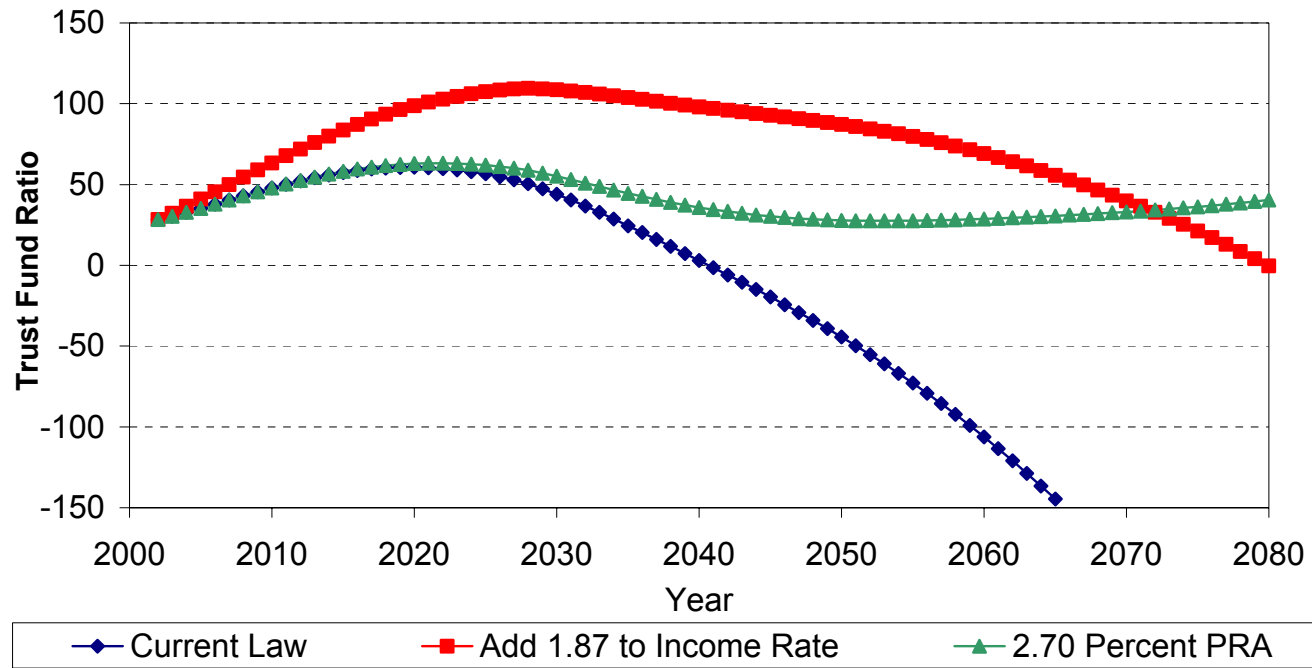Figure 1: Estimated Income and Cost Rates, Intermediate Assumptions

Figure 2: Trust Fund Ratios Under 3 Different Scenarios