Prospects for Social Security Reform

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Frontispiece: Special Treasury securities, stored in a federal government filing cabinet in West Virginia, represent $700 billion in Social Security Trust Fund assets. Photo: Jeff Baughan.

Chapter 8
Thinking About Social Security's Trust Fund

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The U.S. Social Security Act of 1935 placed a relatively strong emphasis on individual equity: retirement benefits were designed to be closely linked to taxes paid. An individual was insured if he worked at least five years in covered occupations and earned at least $2,000 in those jobs before reaching the age 65. The first benefits were to be paid to those who turned age 65 in 1942, five years after people began to pay the social security payroll tax. The original program achieved some equity across individuals as well: benefits were calculated according to a progressive formula that gave a higher rate of return on payroll taxes paid to those with lower lifetime wages. Total benefits, however, were roughly equivalent to total payroll taxes previously collected plus interest.[1] In this way, the U.S. social security system was originally conceived to be a mostly *funded* program that deposited payroll taxes into a Trust Fund invested in special-issue government securities. Payment of benefits was limited initially to those who contributed to the system.

The funded nature of the program meant that elderly persons who were already retired at the inception of the social security system — also a group hit hard by the Great Depression — could not receive benefits because they had not contributed. Responding to this group's needs, the social security program then began its long and gradual shift to a *pay-as-you-go* system. In a pure pay-as-you-go system, there is no Trust Fund. Rather, benefits are paid with current tax receipts. This shift toward a pay-as-you-go system began with the 1939 amendments, which moved the focus away from individual equity and toward protection of the family, including dependents and survivors. The 1939 amendments also sought to provide "socially adequate" benefits, including benefits for the elderly who had paid little or nothing into the system. The 1950 and 1952 amendments substantially liberalized conditions under which people could qualify for full benefits, and provided full bene-

fits to newly covered workers not previously covered. Later amendments increased benefits even more. By 1983, the system was almost entirely pay-as-you-go: the value of the remaining trust fund was only about $20 billion which, by one estimate, was less than 1 percent of OASI's liability at the time.[2]

The Social Security Act of 1983 (SSA83)addressed the 75-year solvency problem facing the system at that time by, among other things, increasing the payroll tax. Projected revenue collected in the following years was anticipated to exceed outlays, the extra revenue going into the trust fund. The intention of SSA83 was, in part, to create a buffer against a recession but, more importantly, to create a large enough trust fund to weather the large increase in the retiree/worker ratio as the "baby boom" generation began to retire around the year 2010. At the end of 1996, the OASI Trust Fund held $514 billion in government securities. However, the SSA83 did not go far enough to create a solvent OASI system for the long run. Under the "intermediate assumptions" of economic and demographic characteristics of the economy, as calculated by the Board of Trustees Report (1997), the Trust Fund assets will be exhausted by the end of 2029, after which full benefits cannot be paid on a timely basis without additional borrowing, an increase in tax rates, or additional revenue from elsewhere.

The existence of a social security trust fund raises several questions to be addressed in this chapter. Did the tax increase imposed in the 1983 amendments, which led to a sizable increase in the trust fund, have an economic rationale? That is, did the 1983 amendments increase national saving? And irrespective of whether the 1983 amendments increased national saving, the amendments did unambiguously increase *social security's* reserves. Should the government seek to increase these reserves even more by investing a portion of the reserves in equities? In particular, what are the pros and cons of investing some of the trust fund in corporate equities in order to delay the collapse of the fund? Another question deals with the optimal size of the trust fund. Specifically, what are the pros and cons of moving to a funded social security system by increasing the size of the trust fund? Finally, how does this option compare with *privatizing* social security, that is, moving to a defined-contribution, funded system based on individual accounts?

What Was the Rationale for the 1983 Amendments?

Mechanically, the trust fund has grown because the United States has chosen to finance benefits with earmarked taxes that exceed benefit payouts (Feldstein and Samwick 1997). *Politically*, the choice to finance benefits via earmarked payroll taxes was no historical accident. Virtually all countries with a public pension system finance benefits with earmarked payroll taxes (see Manchester, this volume). President Franklin Roosevelt's intent was to ensure that the U.S. social security program was viewed more as a retirement

plan than as a handout, thereby making it harder to abandon after his presidency:

> We put those payroll contributions there so as to give the contributors a legal, moral, and political right to collect their pensions. . . . With those taxes in there, no damn politician can ever scrap my social security program. (quoted in Miron and Weil 1997: 11)

But is there a potential economic rationale for increasing the trust fund through tax increases as was done in the 1983 amendments? The answer is yes, on two counts. One rationale has to do with tax efficiency interacting with demographic considerations. Without reserves accumulating in a trust fund, the social security payroll tax would have to increase significantly in the future in order to pay for the benefits of the baby-boomer cohort. Economic theory shows that the deadweight loss resulting from distortionary wage taxation rises with the square of the tax rate, so it is more efficient to smooth payroll taxes over time instead of maintaining a strict pay-as-you-go system in which future tax rates would have to rise substantially.[3] A second motivation for funding is distributional: pre-funding future benefits reduces the tax burden on future generations. These justifications for the 1983 amendments, however, are valid only to the extent that the 1983 amendments actually increased public, or national, saving.

The 1983 Amendments, Public Saving, and Political Economy

Did the 1983 amendments increase public saving, or did the existence of additional resources in the trust fund simply create a ready source of financing for non-social security government debt? The answer to this question depends primarily on what one assumes would have happened if the bill had not been passed (the unobserved counterfactual).

Consider what I refer to as the *comprehensive* deficit created during time period t in which implicit pay-as-you-go social security debt is converted into explicit debt:

(1)
$$
\begin{aligned}
D_{t+1} - D_t = \ & [(G_t - T_t) + r_t D_t^{NS} \ \} \text{``on-budget'' deficit} && \left.\begin{array}{l}\text{Total}\\ \text{deficit}_t\end{array}\right\} \\
& - (X_t - B_t)] \quad \} \text{social security surplus} \\
& + [(X_t - B_t) + r_t TF_t] \quad \} \text{``left pocket''} && \Delta \text{ in} \\
& + [(D_{t+1}^S - D_t^S) \quad \} \Delta \text{ in pay-as-you-go net liability} && \left.\begin{array}{l}\text{social}\\ \text{security's}\end{array}\right. \\
& - (X_t - B_t) - r_t TF_t] \quad \} \text{``right pocket''} && \left.\begin{array}{l}\text{net}\\ \text{liability}\\ (t, t+1)\end{array}\right\}
\end{aligned}
$$

where

B_t = social security benefits paid at time t

D_t = stock of comprehensive debt at the beginning of time t

D_t^{NS} = stock of non-social security debt at time $t = \sum_{s=0}^{t-1} (1+r)^{(t-1)-(s+1)}(G_s - T_s)$

D_t^s = net liability of the pay-as-you-go portion of social security at time $t = $ present value of benefits less the present value of pay-as-you-go taxes (before Trust Fund contributions) of workers at time $t-1$

G_t = level of government spending at time t

r = interest rate on government bonds at time t

T_t = non-social security tax revenue at time t

TF_t = trust fund balance at time $t = \sum_{s=0}^{t-1} (1+r)^{(t-1)-s}(B_s - X_s)$

X_t = social security tax revenue at time t

The first [•] term on the right-hand side of equation 1 is what the government reports as its official unified national deficit, equal to the primary deficit plus interest on the outstanding debt, less the social security surplus. Since social security is now technically off-budget, the total deficit less the social security surplus is referred to as the "on-budget" deficit. The second [•] term reflects the borrowing from social security that must be paid back with interest. This counts as a charge against the government budget exclusive of social security, what I have dubbed the "left pocket" of government. The third [•] term has two components. The first is equal to the growth at time t of the net liabilities of the pay-as-you-go portion of social security. The second component of the third term reflects the payback that social security—the "right pocket" of government—receives from the non-social security side of the federal government. Adding these two components gives the change in social security's total net liability. The left and right pockets cancel each other, reflecting the fact that payback of the trust fund with interest does not affect the comprehensive deficit. Nonetheless, we are still left with the social security surplus, in the first term of equation 1.

It is obvious, therefore, that an increase in the payroll tax reduces the comprehensive deficit—increasing public saving—*if* the other policy variables do not change. Moreover, for the purposes of estimating the budgetary impacts of specific legislation, the only reasonable approach is to hold all other laws constant. Nonetheless, some analysts believe that the passage of a particular piece of legislation could affect the political dynamics of subsequent legislation. For example, Barry Bosworth (1996: 104) questions whether it is legitimate to assume that these other policy variables remain constant when actions are taken to boost trust fund reserves. In his view, those actions could eventually be offset by changes elsewhere in the budget: "Most Americans," he argues, "are normally very surprised to learn that the surplus is being used to finance other programs, and that in most public discussions the budget deficit is defined to include the finances of social

security." As shown in equation 1, an increase in payroll taxes would not increase public saving (including changes to social security's pay-as-you-go liability) if the payroll tax increase was matched dollar-for-dollar in present value with increases in promised future benefits, or other government spending, or reductions in other taxes.

Putting these pieces together, the 1983 amendments would have increased public saving (as defined above) if one assumes that (1) the government would have been willing to run a higher total national deficit in the absence of SSA83, and (2) the government did not promise to increase future benefits or fail to decrease benefits if this is what would have happened without SSA83. Excluding trust fund surpluses from the deficit measure — that is, the "on budget" deficit — could increase public saving by as much as the trust fund surplus if this policy change forced the government to reduce public spending by an equal amount. Then the new "on budget" deficit is equal to the former unified budget deficit. Bosworth argues that a focus on the "on budget" deficit would accord better with most people's perception of the deficit and could therefore increase public saving.

Some state-level empirical evidence supports Bosworth's position. To quote Bosworth (1996: 105): "[m]ost states present their budgets in ways that exclude their retirement programs, and nearly all have sought some degree of funding of those liabilities." He continues: "While the annual state retirement fund surpluses have grown steadily, to over 1 percent of GDP in the 1990s, the nonretirement budget balance has fluctuated about zero, with no clear tendency to rise or fall over time." But can we safely assume that state-level evidence is indicative of how the federal government works? Unfortunately, the answer to this question is unclear.

But whether or not the 1983 amendments increased public saving, the amendments did increase the *accounting* measure of the size of the trust fund. Should the government attempt to increase the trust fund even more by investing some of the reserves in equities? Without any change in legislation, this open-market operation would lead to a larger reported unified deficit. But, as the Technical Panel (p. 86) points out, "It is plausible, however, that if legislation allowed the Trust Funds to invest in equities, legislation could also require that the purchase of equities would not count as an expenditure and thus would not alter the measured unified budget deficit." The next section renews some of the economic, distributional, and political ramifications of investing a portion of the trust fund in equities.

Changing the Investment Strategy of the Trust Fund

The equity premium, or the average rate of return to equities above nominal short term government debt, has been historically about 6 percent (Kocherlakota 1996). This premium creates a tempting opportunity to help

rescue the soon-to-be insolvent social security system by investing the large and growing trust fund in equities instead of government debt. This proposal, discussed for years, has taken on new popularity with the recent release of Social Security Advisory Council Report (Advisory Council 1997) in which several council members urged policymakers to consider this option. According to Jones (1997), switching trust fund investment policy so that equity composed 21 percent of initial wealth and 50 percent of all inflows in the stock market would extend the life of the trust fund by eight years over baseline — from the year 2029 to the year 2037 — if equity investments performed as expected.

Proponents of investing the trust fund in equities argue that this policy change could help maintain the current level of benefits in the future without increasing the payroll tax. Moreover, some of the higher returns could be plowed back into the fund to boost public and national saving. It has also been argued that a switch toward some equities would also make the government a better portfolio manager:

Currently it can be argued that the government is not performing its role as fund manager for social security as well as it might — not because of any failure on the part of those managing the system but because social security by law is allowed to invest only in the most conservative of investments: long-term, low-yield government bonds. Trustees of private pension systems and managers of state pension systems, who have the authority to invest much more broadly, would surely be castigated if they pursued such an ultra-conservative investment policy, and it can be argued that social security should have the same freedom to invest part of its funds in the broad equities market representing practically the entire American economy. (Advisory Council 1997: 83)

Arguments against investing the trust fund in equities are as old as the social security program itself. Historically, the concern was that the government would accumulate too large a share of the nation's capital stock (Miron and Weil 1997). More recent concerns have focused on the government's using its voting rights as a shareholder in a political manner. Karl Borden (1995) writes:

Allowing a fund of such magnitude to be invested by government bureaucrats is asking the government to make risk assessments in the private sector and subjects the fund to political influence. We have only to consider recent suggestions by the Clinton administration that private pension funds be required to invest a portion of their assets in "socially responsible" projects, or to consider the effects of the community reinvestment requirements the government has placed on the banking system, to realize that politicians cannot be trusted to invest fund assets with the objective of wealth maximization for fund participants. (1995: 4)

Trust fund investment discussions have also raised questions about how the risk would be assigned (Zeldes 1997). This issue was considered in broad terms by the Technical Panel of the recent Advisory Council:

A different way to think about the proposal is to realize that the risks and returns in the social security agency's portfolio [of equities] would be passed on to households, perhaps with some lag. When portfolio returns are high, this improves social security benefits or reduces social security taxes in the future; when returns are low, this approach reduces social security benefits or increases taxes in the future. . . . [Another] possibility is that Trust Fund risk will fall on as yet unborn generations, who have no opportunity to hold stocks now on their own accounts. Holding equities in the fund could give future generations exposure to current stock returns, thus improving risk sharing across generations. (*Technical Panel* 1997: 86)

Size of Trust Fund Relative to the Market

Would investing the trust fund in equities give the government too large a share of the private equities market? Hammond and Warshawsky (1996) argue that the answer is no. They consider the Maintain Benefits (MB) plan endorsed by six of the 13 members of the Social Security Advisory Council, which favors investing up to 40 percent of the trust fund in stock. This goal could be achieved by the year 2014, according to Hammond and Warshawsky. They then demonstrate that social security's share of the equities market in the year 2020 would range from 1.9 percent of all U.S. equities (assuming 9 percent real growth of all assets), to 4.9 percent (under 5 percent growth) to 27.5 percent (under −2 percent growth). They do note, however, that limited trust fund investments to a narrow index such as the S&P500 could be problematic. The value of all U.S. equities totaled about $8 trillion, but the value of the S&P500 was less than 10 percent of this value in 1996, only slightly larger than the value of the trust fund itself. Hammond and Warshawsky conclude "[p]resumably, social security equity investments would be made according to some of the broadest indexes (e.g., the broad Russell or Wilshire indexes) and would, therefore, have a limited sectoral impact."

Political Stock Choices

Whether the government would — or should — select stocks with political goals in mind is a thorny issue beyond the scope of this paper. Empirically, though, it appears that the federal government has exercised restraint from political bias when retirement assets are held in the form of individual accounts. Probably the most important example of this is the federal government's Thrift Savings Plan, the $30 billion (in 1996) defined-contribution retirement program for federal employees. The TSP offers an array of passive index funds free of political constraints.

But, the empirical case for government Trust Fund investments in equities is not all supportive. State and local governments' employees' pension funds have experienced far more political intrusions:

There have been clear instances in which political influences on some of these funds have led to misguided investments and undue losses for the funds. A number of states have guidelines for their pension funds that encourage some types of investments (e.g., investments that focus on projects or companies located in that state) and discourage other types of investments (e.g., investments in foreign companies or in companies that are extensively involved abroad or in specific countries), as compared with those that would conform to a "prudent person" fiduciary approach. Indeed, statistical studies of the annual returns yielded by state employee pension funds in the late 1980s and early 1990s have shown that the returns are significantly lower when the funds' trustees and managers are subject to greater political influence. And a number of state legislatures have raided their employees' pension funds when fiscal conditions were perceived to be tight. (White 1996: 17)[4]

In addition, investing in equities inevitably involves investing in some controversial firms. Obvious examples include tobacco stocks, foreign-owned firms, environmental polluters, and the like. Less obvious examples — but probably the most politically charged — include pornography, gambling, and abortion, as well as corporations whose chief executives are prominent advocates for partisan causes or religious organizations. These are issues that must be addressed in any proposal to invest the Trust Fund in equities.

Who Bears the Risk?

If trust fund assets are included in equities, a question arises about who bears the risk of fluctuating equity values. SSAC members favoring equity investments were clear that benefits should remain non-random:

. . . except for this change in investment policy, social security's principles and structure would remain unchanged under this approach. Social security continues as a defined-benefit plan, with the amount of benefits and the conditions under which they are paid still determined by law rather than by individual investments. . . . there would be ups and downs in returns but only very long-range trends would matter. And the assumed rate of return, while important, would be secondary to the fact that benefits would remain defined by law rather than by the relative uncertainty of individual investment decisions. (Advisory Council 1997: 86)

Hence under the MB plan, the risk associated with trust fund investment plan is passed on to future generations. Specifically, if the equity fund performs as expected, *current* workers are rewarded, in terms of future retirement benefits that are larger than those compatible with current tax rates, but *future* workers are pre-committed to absorb fully any shortfall in the trust fund below its expected value, in the form of larger taxes. Future workers are rewarded in the form of a lower payroll tax only if the equity portion of the Trust Fund performs better than expected. Putting these pieces together, future workers face an expected payoff equal to zero but with a risky tax rate. This risk allocation imposes an actuarial pay-as-you-go tax on future generations, the value of which can be assessed in a complete market setting

using an option pricing approach. For example, the $3-trillion-dollar equity investment suggested by some members of the recent Advisory Council could place as much as a $9 trillion actuarial liability on future generations (Smetters 1997a).

When there are no missing financial markets, the value of the actuarial tax placed on future workers is as large as that of keeping the trust fund invested in bonds and raising the same expected revenue by increasing the payroll tax *only* on future workers (Smetters 1997a). Future generations would actually be better off, relative to this plan, if the payroll tax were increased immediately so that current workers participated in maintaining their own future level of benefits—a result that holds at any value of risk aversion. This result is ironic, given that many of those advocating trust fund investment in equities see it as a way of avoiding a payroll tax increase.

In reality, of course, financial markets are incomplete in important ways. One missing element corresponds to the inability of current and future workers to negotiate risk-sharing contracts such as futures and options contracts. Indeed, an argument for investing the trust fund in equities under these types of plans is expressed by the Technical Panel (1997: 86): "Holding equities in the fund could give future generations exposure to current stock returns, thus improving risk sharing across generations."[5] It follows that the *total* actuarial cost to future generations might be less than the explicit tax increase discussed above.

On the other hand, the total cost might actually be more than the explicit tax increase, if future workers are already exposed to a significant amount of uncertainty. The pay-as-you-go portions of the defined-benefit Medicare and social security program alone create an enormous amount of tax rate uncertainty for future workers. Indeed, the difference in combined OASDI-HI cost rates between the 1997 Trustees "low cost" and "high cost" estimates over the next 75 years is remarkably large. In particular, the 1997 Trustees estimate that supporting present-law OASDI-HI benefits would require anything from a negligible increase in the payroll tax to as much as a 30 percentage point increase! Government debt and the tax treatment of capital income also shift risk to future generations (Gale 1990; Bohn 1997a). So does the tendency of the budget deficit to increase during economic downturns, caused by a decrease in revenue (associated with linear and progressive taxes) combined with increased mandatory spending during a recession. Since the willingness of a person to accept additional correlated risk depends on the person's total portfolio of risky assets and liabilities, it follows that all risks faced by future workers—correlated and orthogonal to the risks associated with trust fund investment in equities— must be included in determining whether future workers are currently under-exposed to contemporaneous shocks. The enormous amount of risk facing future workers suggests that they might favor an explicit tax, instead of an uncertain tax that varied with equity returns. In any case, even if—very

hypothetically — future workers were under-exposed to current shocks, the equity investment envisioned by some of the Advisory Council members cannot actually be beneficial to future workers. The reason is that future workers bear all the risk but face a zero expected payoff. This zero-mean gamble, therefore, decreases the expected utility of future workers in proportion to their level of risk aversion.

Another argument for trust fund investment in equities is to expose more *current* workers to equity returns (Diamond 1998). Since transaction costs associated with equity investments are rather low (Mitchell 1998), probably the best motive for doing this is paternalism (i.e., people "irrationally" under-exposing themselves to equity risk). But rational agents, who would like to offset this policy change, would be hurt due to the capital gains tax and any short-sale constraints. To prevent shifting the risk to future generations, policymakers would have to commit to reducing benefits on old people — instead of increasing taxes on young people — if equities underperformed. It is questionable whether this commitment is time consistent. Moreover, how would benefits be reduced? Although benefits could be reduced in a progressive fashion, an across-the-board reduction could be regressive. The exact politics of what would happen is unclear.

The Impact of Increasing the Size of the Trust Fund on the Economy

The issue of how to invest social security's current reserves is economically different from whether to increase the size of the reserves. The former issue pertains to how to invest existing saving, while the latter pertains to generating new saving, a process that involves tradeoffs between contemporaneous and future consumption. In light of the previous political analysis, I will assume that an increase in the trust fund cannot be counted against the on-budget deficit in calculating the government's total deficit.

Efficiency Gains

Probably the most important hurdle that any proposal designed to pre-fund social security must confront is the transition to the new system — in particular, how to continue to pay benefits to those who are already retired or near retirement while, at the same time, allowing young savers to divert some of their social security contributions to private saving accounts. Since social security is currently mostly pay-as-you-go, allowing young people to shift their social security contributions to the private capital market removes the tax revenue needed to pay benefits to the current elderly.

There are several proposals that appear to be able to pre-fund or privatize social security while making *every* generation better off. It is important to

recognize, however, that these proposals are actually piggybacking on some other efficiency gain associated with tax reform (as in Breyer and Straub 1993) or from a direct arbitrage in which the government effectively borrows at a low rate and lends at a high rate (as in Altig and Gokhale 1997). Efficiency gains are unlikely to result from increased funding. The reason is that there is nothing inefficient about a transfer program that does not distort the price of contemporaneous consumption at the margin unlike, e.g., capital-income taxation. Other than changing the tax base from wages to another base, a switch from a pay-as-you-go to a funded system with recognition of all outstanding liabilities would require the same distortionary tax to service the debt as under the pay-as-you-go system.

This does not mean, however, that the payroll tax does not distort labor supply. The tradeoff involved in creating a pay-as-you-go program is that the windfall to the initial elderly comes at the cost of generating a stream of benefits whose present value is less than the present value of taxes for all future generations. The payroll tax therefore will generally be distorting. The "curse" of the pay-as-you-go system is that there is no way to reverse this distortion via pre-funding in such a way that all generations are made better off.

Macroeconomic Gains

For many reformers, efficiency gains are not the end of the story. In particular, pre-funding social security is viewed as desirable even if sacrifice is required on the part of transitional generations. And, indeed, the long-run macroeconomic impact of pre-funding social security can be quite substantial. For instance, Kotlikoff, Smetters, and Walliser (1998) demonstrate that full pre-funding of social security in their model leads to a 37 percent increase in the long-run capital stock, 4 percent increase in labor supply, 11 percent increase in output, 7 percent increase in wages, and a 19 percent decline in the cost of capital. This translates into a long-run 5 to 8 percent increase in full lifetime income, depending on the lifetime income group. Feldstein and Samwick (1997) also obtained large gains in their model.

As argued above, however, these large long-run gains are not free. Increasing the full lifetime resources of future generations requires an equal present-value reduction in the full lifetime resources of intermediate generations (Mitchell, Geanakoplos, and Zeldes, this volume). The actual utility loss on the part of transitional generations would have received from social security and the bond yield.[6] The larger this difference, the less valuable future social security benefits are to transitional generations and so losing them is less of a concession. Equivalently, a larger difference means that more of the payroll tax is effectively devoted to the windfall to the initial generations who received benefits without paying much into the system, rather than to one's own retirement benefit.

Tax Rates

Just how much would the payroll tax change in the long run, if social security were pre-funded? Feldstein and Samwick (1997) estimate that social security's current 12.4 percent payroll tax, which will need to rise to 18.75 percent in the future under present-law benefits, can eventually be replaced with only a 2 percent payroll tax invested in the capital market *if* the market performs as expected. This is because the social marginal product of capital has historically averaged a 9 percent real rate of return while the growth rate of the pay-as-you-go tax base is predicted to grow at around 1 percent during the next several decades.

Since the historic rate of return to government debt is only slightly larger than the future expected return to social security, most of the Feldstein-Samwick projected reduction in the payroll tax rate comes from exploiting the wedge between the equity premium and the historical bond yield. (The Kotlikoff, Smetters, and Walliser 1998 study also relies on this wedge.) To be sure, exploiting this wedge cannot necessarily be dismissed out-of-hand in the presence of the debate over why equity has historically delivered a 6 percent higher after-tax rate of return on average over debt (Kocherlakota 1996). In any case, to the extent that this wedge is indeed explained by risk and is therefore not exploitable, a long-run payroll tax equal to about 14.4 percent will be needed to replace the future 18.75 percent payroll tax using Feldstein and Samwick's parameter choices. (As noted above, the decline in the tax rate from 18.75 percent to 14.4 percent comes at a cost to transitional generations.) If social security were switched to a strict defined-contribution plan, a payroll tax rate less than 14.4 percent would fail to replace the current level of social security benefits on a risk-adjusted basis. If social security were kept as a defined-benefit plan, a payroll tax rate less than 14.4 percent would impose a large unfunded liability on future generations. Smetters (1997b) estimates that the Feldstein-Samwick plan would keep about seven-eighths of social security's unfunded liabilities in place if social security is kept as a defined-benefit plan.

Increasing the Size of the Trust Fund Versus Privatization

While pre-funding social security is unlikely to lead to any true efficiency gains, *privatizing* social security may. Social security remains a defined-benefit (DB) pension plan under the pre-funding approach. Privatization then involves switching from a DB plan to a defined-contribution (DC) plan. Any advantage or disadvantage that privatization has relative to pre-funding comes from this switch in pension models. This section considers several reasons why the DC model is probably superior to the DB model for providing old-age support.

Simplicity

While the assumption of full information is standard in economic theory, the effective marginal tax is actually very difficult to compute under social security. This is because the tax rate differs not only categorically (i.e., by earnings level, primary earner vs. secondary earner, etc.) but across the lifecycle as well, because the private market rate of return is higher than the rate of return to social security for most contributors (Feldstein and Samwick 1992). Moreover, people might not understand how their benefits are linked to their previous wage income in a DB plan. Indeed, the reader is encouraged to question non-economist friends and relatives about how they think that their social security benefits are calculated: answers like "I don't know" or "x fraction of my last y ≤ three years of earnings before retiring, multiplied by z years worked" (i.e., private pension rules!) will undoubtedly be popular responses. The payroll tax therefore is more distorting than it need be — and during the prime working years — for these uninformed workers.[7]

The pure efficiency gains associated with full information can be quite large — e.g., as high as 0.6 percent of *full* lifetime income (i.e., before the purchase of leisure) or 1.5 percent of *actual* lifetime income (i.e., after the purchase of leisure) — if people perceive no marginal linkage in the current system (Kotlikoff, Smetters, and Walliser 1998). Starting from a higher perceived marginal-tax benefit linkage reduces these gains.

Privatizing social security — and, in particular, moving from a DB to a DC system — may improve efficiency to the extent that (1) people are not fully informed of their marginal tax-benefit linkage, *and* (2) a switch to a DC system improves the perceived linkage, thereby reducing the effective tax rate on labor income. Specifically, relative to social security in which the same payroll tax is used for redistribution and to pay for one's own future benefits, a DC system can disentangle these two components, and may thereby improve efficiency. These efficiency gains, though, can theoretically be achieved within the current *pay-as-you-go DB* social security system if the government is willing to inform *each person at each point in time* how an additional dollar of his payroll tax is translated into future benefits. Doing so, however, would require exposing the relatively low rate of return received by many households due to the inter-generational and intra-generational redistributing roles of social security. Switching to a private DC system therefore would have the potential advantage of making the overall tax-benefit linkage explicit without these reporting requirements.

While pre-funding social security under its current DB status would also reduce the effective tax rate of social security by bringing the rate of return to social security contributions closer to the market rate of return, this effect alone will not increase economic efficiency unless accompanied by an in-

creased understanding of the tax-benefit linkage. Although the efficiency gains from pre-funding Social Security could be non-trivial if it led to an improvement in information, they are unlikely to be as significant as those from moving to a simpler DC system, unless the separate benefit and re-distribution roles in a funded DB system are made more clear.

Annuity Markets

To the extent that social security provides annuitization that may not other-wise exist in the private market due to adverse selection, moving to a DC plan might decrease efficiency unless at least some portion of the assets in the DC plan required to be annuitized upon retirement.[8] However, there is no reason to believe that the *full* mandated annuitization inherent in social security is optimal.[9] At least some lump-sum disbursement will be desirable for the purpose of making a bequest, giving inter-vivos transfers to children (e.g., as a down payment on a house), or holding a buffer for medical and non-medical expenses faced by beneficiaries and their heirs. While the an-nuity stream can be used to purchase life insurance in order to make a bequest, little can be done regarding the other concerns without at least some lump-sum disbursements. Moreover, on the distributional side, full mandated annuitization tends to be regressive by redistributing resources from shorter-lived poor people to longer-lived rich people, *ceteris paribus*. A DC plan, in contrast, can deal with annuitization via mandates. It is also inherently more flexible in the design of the payout options. For example, Chile allows for lump-sum withdrawals above some minimum mandated annuity level.

Risk Sharing

It is also commonly argued that a funded DB plan can better shift aggregate risk across generations. This risk shifting, however, requires that at least part of the payroll tax in a DB plan is transferred from young to old workers. This, in turn, complicates the marginal tax-benefit linkage in the DB plan. In contrast, a DC plan can do better.

At least some of the risks in the DC plan would also tend to be shifted across generations, since the government cannot credibly commit to allow-ing people to retire with few assets. Indeed, while DC plans are commonly criticized for forcing workers to bear all the risk, all actual major privatiza-tion implementations continue to provide rather generous minimum guar-antees financed on a pay-as-you-go basis.[10] A realistic DC plan, therefore, would be composed of a no-redistribution private account, along with a pure redistribution add-on tax. This separation has the advantage of a com-partmentalizing the pure distorting tax, thereby avoiding commingling re-

distribution with one's own retirement saving. This "twin pillars" approach has been extremely popular in Latin America (Mitchell and Barreto 1997).

In addition, the DC plan would tend to be more flexible than the DB plan in designing risk sharing. This is because the minimum benefit guarantee could be set at a lower and more reasonable level than the *fixed* benefit guarantee that might be inherent in a DB plan. While it is true that the fixed benefit guarantee passes any *excess* returns forward in time, the option value of this feature is quite small for realistic parameterizations (Smetters 1997b). The guarantee level itself is the primary issue, and a smaller minimum benefit will tend to have a much lower unfunded actuarial cost than a larger fixed benefit. Indeed, it is unlikely that the level of risk shifting that might be inherent in a funded DB plan is optimal ex ante, unless policymakers actively change benefits in addition to changing taxes in response to large shocks to equity prices. To be sure, some risk shifting across generations is desirable in order to avoid a low level of post-retirement consumption. Guaranteeing a higher level of post-retirement consumption, however, would be essentially redistributional in nature and would work in the opposite direction from reducing unfunded liabilities.

Administrative Costs

DC plans are commonly criticized as having higher administrative costs than a well-managed DB plan. Promoters of this position often point to the high transaction costs that exist in both the Chilean and UK systems. In contrast, the U.S. social security system is often argued as being remarkably efficient.

However, there are examples of very efficient full-featured DC plans in the United States. Indeed, while promoters of the high-transaction-costs argument typically consider administrative charges of around 100 basis points, a large passive index fund can, in reality, have much lower overhead fees (Mitchell 1998). Total administrative fees (excluding collection fees) of the Thrift Savings Plan, which is the DC plan for federal workers with $45 billion in assets at the end of 1996, are currently less than nine basis points (11 basis points if forfeited non-vested employer contributions are excluded). This overhead charge includes many basic services such as money management, operating and development costs of the recordkeeper's computer system, and printing and mailing of publications and participants' statements, as well as the TSP Service Office that handles its optional annuities and loan programs in addition to standard inter-fund transfers and account balance inquiries. But even nine basis points is pessimistic: the TSP fees have decreased almost monotonically from over 30 basis points in 1988, the year of the Fund's inception. In the future overhead fees could decrease to less than a single basis point, or about $\frac{1}{100}$ the fee assumed by promoters of the high-transaction-costs argument. The TSP avoids high administrative

fees, in part, because it limits investment choice to three (soon to be four) passively-managed fund options.

While limiting choice is not necessarily efficient even if it reduces costs, restricted and regulated choice might be a desirable route to take in a privatized social security system where excessive brokerage fees resulting from uninformative advertising, wasteful competition over a homogeneous product, "account churning," and fraud are especially important issues. Limiting choice might also be desirable on moral hazard grounds in order to prevent excessive risk-taking by those whose account balances are low enough to trigger a minimum benefit. With these controls in place, it is quite possible that a DC plan could have just as low transaction costs as social security — and perhaps even lower, if choices are restricted enough so that firms are basically forced to compete on the cost side instead of on the revenue side. Achieving low costs might also require allowing each person to have only a single account in order to reduce record keeping.

Political Uncertainty and Redistribution

Some might view any inefficiency caused by redistribution within social security as simply the cost of maintaining public support for redistribution. Alternative forms of redistribution compatible with a DC model would probably gain public support, however. This is especially true of the Earned Income Tax Credit (EITC) program, which rewards people for working. Indeed, the EITC program has been expanded in recent years, even in wake of the decline in many other forms of welfare. Replacing social security's intra-generational redistribution with an EITC program can lead to non-trivial efficiency gains in the presence of borrowing constraints, especially for the poor (Smetters 1997c).

It has sometimes been argued that a DC plan might face lower political risk than a DB plan, since benefits are no longer determined by the will of policymakers. But the tax treatment of DC accounts will subject them to political uncertainty as well, so it is unclear which plan performs better here (a point emphasized in Smetters 1997b and Diamond 1998). It is true, though, that the assets in a DC plan are decentralized, a potential advantage over pre-funding. Indeed, if the government failed to take social security completely off budget, or reverted back to the current unified budget deficit measure in the future, all of the assets in the trust fund could be spent on either tax reductions or government consumption without changing either the reported trust fund balance or "deficit" measure.

Conclusion

A trust fund is an accounting device that reflects a political choice to finance social security benefits with earmarked taxes rather than with general reve-

nue. Increasing the size of the trust fund through a payroll tax increase, like the one implemented in the 1983 amendments, leads to a smaller distortion of labor supply, relative to the policy of waiting to increase the payroll tax only when necessary to pay for benefits. An increase in the payroll tax before the baby-boomer cohort begins to retire might also be justified on distributional grounds. These arguments, however, are at least partially undermined if an increase in the size of the trust fund is offset by either dissaving in the non-social security side of government, or an increase in future benefits. Calculating a value for this offset is an important topic for future research.

We also summarize previous analyses of the merits of investing the trust fund in equities. Under such a proposal, it is unlikely that the government would own a large share of total assets in the economy. Limiting trust fund investments to a narrow index such as the S&P500, however, could be problematic, due to the small size of the funds in such an index relative to the total assets in the economy. Mixed evidence is reported on the hypothesis that politicians might manipulate stock choices for political gain. Although the federal government has resisted this temptation with retirement assets held in the form of individual accounts, the trust funds of state and local governments have experienced some political intrusions. Finally, we showed that investing the trust fund in equities under the current defined-benefit system imposes a non-trivial actuarial tax on future workers. Whether this redistribution is good or bad is a normative question outside the scope of this chapter. In theory, future generations may not be harmed very much by this transfer of risk, because no market exists allowing current and future generations to engage in risk sharing. On the other hand, a substantial amount of risk is already being transferred to future generations under baseline policy, and transferring even more risk might potentially be very harmful. Quantifying the amount of risk under baseline policy is difficult but a worthwhile avenue for future research.

Finally, we described the merits of pre-funding social security (increasing the size of the Trust Fund) and privatization (switching to a defined-contribution system). It was argued that while pre-funding social security would tend to result in few — if any — true efficiency gains, privatization might. A privatized system is more simple and more flexible. Both of these factors can result in potentially large efficiency gains. Quantitative gains from simplicity (coming from reduced labor supply distortion) are available, though potential gains associated with greater flexibility have not yet been quantified. Calculating these gains represents an important avenue for future research.

Notes

1. A summary of major changes in the social security program is given in Kollmann (1996) and the *Social Security Bulletin* (1995).

2. The value of the OASI Trust Fund at the end of 1993 was $19.7 billion (1995 Statistical Supplement, Table 4.A1). Feldstein (1995) estimates that social security's net liability (present value of future benefits less present value of future payroll taxes across all living adults) in 1983 equaled $5 trillion using a 3 percent discount rate. For other estimates see Goss (this volume).

3. A general intertemporal tax smoothing argument was first developed by Barro (1979) and has been examined in a stochastic environment by Bohn (1990).

4. The empirical evidence referred to by White can be found in Romano (1993), Mitchell (1993), and Marr, Nofsinger and Trimble (1996).

5. Bohn (1997b) provides a rigorous treatment, as well as thoughtful cautions, on this result.

6. In fact, the low historical risk of the wages and salary base — the source of the rate of return in a pay-as-you-go social security system — relative to historical bonds suggests that an even lower rate could be used to discount social security liabilities (Smetters 1997b).

7. Technically, the payroll tax need not be fully distorting even in this case, if earnings near retirement are highly correlated with previous productivity levels.

8. Estimates of the severity of this problem are found in Friedman and Warshawsky (1990) and Mitchell, Poterba, and Warshawsky (1999). Abel (1986), however, shows theoretically, that the annuity protection that social security already provides tends to enhance the adverse selection problem in the private annuity. In recent analysis using a large-scale simulation model, Walliser (1997), shows that even if economic agents purchased a large amount of annuities due to an absence of a bequest motive, the excess of the price of an annuity above its actuarially fair value would, as a percent of the fair value, only fall from about 9 percent to 6 percent. It follows that privatization without mandates may not lead to the development of an annuity market with actuarially-fair annuities.

9. Diamond (1998) argues that the value of the "rolling annuity" (risk pooling in case of death prior to retirement) provided by social security can be quite sizable. A portion of a DC plan's assets could also be required to be forfeited upon pre-retirement death. This option would be more flexible than full annuitization.

10. These guarantees have been made explicit in every large privatization experiment, including Chile and El Salvador, the countries with the most ambitious privatization implementations to date. These countries promise to "top up" under-performing private accounts in order to guarantee a minimum level of benefits that, as a fraction of income, is equal to about the average U.S. benefit. The World Bank's privatization plan recommends a similarly sized guarantee. Australia guarantees that its pensioners will do just as well under its new system as under the old. See also Pennacchi (this volume).

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