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THE MISSING PIECE IN POLICY ANALYSIS: SOCIAL SECURITY REFORM

Martin Feldstein

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Professor of Economics, Harvard University, and President of the National Bureau of Economic Research. This lecture was presented as the 1996 Ely Lecture of the American Economic Association on January 5, 1996. I am grateful for the discussions about this subject with a number of colleagues, particularly Alan Auerbach, David Cutler, Laurence Kotlikoff and Andrew Samwick. This paper is part of NBER's research program in Public Economics. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

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ABSTRACT

This lecture discusses the economic losses that result from an unfunded social security retirement system and the potential gain from shifting to a funded system.

The social security payroll tax distorts labor supply and the form in which compensation is paid. Although each individual's benefits are in principle linked to that individual's previous payroll tax payments, the low equilibrium rate of return that is inherent in an unfunded system implies that there is an inevitable "net" payroll tax that causes substantial distortions. The resulting deadweight loss is approximately one percent of each year's GDP in perpetuity, an amount equal to 20 percent of payroll tax revenue and a 50 percent increase in the deadweight loss of the personal income tax.

Even more important is the loss of investment income that results from forcing employees to accept the low implicit return of an unfunded program rather than the much higher return on real capital that would be paid on private saving or in a funded social security program. The present value of the annual losses from using an unfunded rather than a funded system substantially exceeds the benefit to those who received windfall transfers when the program began and when it was expanded.

Shifting to a funded program cannot reverse the crowding out of capital that has already occurred. Recognizing the existing unfunded obligation only makes that piece of the national debt explicit. But shifting to a funded program limits the crowding out of capital formation to the amount that has already occurred. Future increases in annual saving that automatically result from economic growth are able to earn the higher rate of return on real capital. The present value of these gains is equivalent to a perpetuity of more than two percent of GDP a year.

The combination of the improved labor market incentives and the higher real return on saving has a net present value gain of more than $15 trillion, an amount equivalent to three percent of each future year's GDP forever.

Martin Feldstein
National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138

The Missing Piece in Policy Analysis: Social Security Reform

The Richard T. Ely Lecture to the American Economic Association

Martin Feldstein*

Reforming the social security retirement program is an issue of enormous practical importance. Yet it remains the missing piece in American policy analysis. At a time when the Congress and the Administration are considering ways to reform welfare, Medicare, Medicaid, and the income tax, elected officials are still unwilling to confront the serious problems of our social security system. Eventually, however, its deteriorating financial condition will force major reforms. Whether those reforms are good or bad, whether they deal with the basic economic problems of the system or merely protect the solvency of existing institutional arrangements, will depend in part on whether we, as economists, provide the appropriate intellectual framework for analyzing reform alternatives.

Major policy changes that affect the public at large can only happen in our democracy when there is widespread public support for the new direction of policy. In the field of economics, the views of the media, of other private sector opinion leaders, and of politicians and their advisers, depend very much on their perception of what economists believe is feasible and correct. Fundamental policy reforms in a complex area like social security also require the development of

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technical expertise, both in and out of government, about the options for change and their likely consequences. Fortunately, an expanding group of economists is now thinking and writing about social security reform.[1] My remarks today benefit greatly from what they have written and from my conversations with many of them.

I began to do research on the effects of social security and on social security reform nearly 25 years ago (Feldstein, 1974 and 1975). A central concept in my analysis of social security has been the notion of "social security wealth," which I defined as the present actuarial value of the social security benefits to which the current adult population will be entitled at age 65 (or are already entitled to if they are older than 65) minus the present actuarial value of the social security taxes that they will pay before reaching that age. Social security wealth has now grown to about $11 trillion or more than 1.5 times GDP.[2] Since that's equivalent to more than $50,000 for every adult in the country, the value of social security wealth substantially exceeds all other assets for the vast majority of American households. In the aggregate, social security wealth exceeds three fourths of all private financial wealth as conventionally measured.

Social security wealth is of course not real wealth but only a claim on current and future

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[1] Although my debts to these authors will be clear to readers who know this literature, I will generally cite papers in this lecture only when I think that readers may want further amplification of otherwise unsubstantiated statements in the text.

[2]Note that this net social security wealth is the difference between social security benefits and social security taxes. The corresponding gross social security wealth that reflects only the present value of the benefits is about 60 percent higher. Feldstein (1995a) reports an explicit calculation of net social security wealth in 1992 of $7.9 trillion in 1987 dollars. I have rescaled this to 1992 dollars by the rise in the consumer price index and extrapolated it to 1995 by the increase in nominal GDP from 1992 to 1995. Net social security wealth calculated in this way was $11.4 trillion in 1995.

taxpayers. Instead of labeling this key magnitude social security wealth, I could have called it the nation's social security liability. Like ordinary government debt, social security wealth has the power to crowd out private capital accumulation. And social security wealth will continue to grow as long as our current system remains unchanged, displacing an ever larger stock of capital.

The $11 trillion social security liability is three times as large as the official national debt. Although I certainly welcome the current political efforts to shrink future budget deficits, it's worth noting that, even if the traditional deficit is eliminated in the year 2002, so that the traditional national debt is then no longer increasing, the national debt in the form of the social security liability is likely to increase that year by about $300 billion.[3]

Looking further into the future, the aggregate social security liability will grow as the population expands, as it becomes relatively older, and as incomes rise. Government actuaries predict that, under existing law, the tax rate required to pay each year's social security benefit will rise over the next 50 years from the present level of slightly less than 12 percent to more than 18 percent and perhaps to as much as 23 percent.[4]

The financial problems of the system are therefore very serious indeed. But my remarks

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[3]These increases in social security wealth and its liability twin, together with the corresponding amounts for Medicare and Medicaid, are the core of the massive intergenerational transfers that Alan Auerbach, Jagdish Gokhale and Laurence Kotlikoff have warned us about in their important studies of generational accounting. See Auerbach, et al 1991 and 1994.

[4]The 18 percent rate is based on what the Social Security actuaries call their intermediate Alternative II assumptions while the 23 percent rate is based on the somewhat more pessimistic Alternative III assumptions. Experience suggests that even these alarming predictions may be too optimistic. In 1983, the social security actuaries calculated that a 12 percent rate would be enough to finance social security benefits until the year 2065. A dozen years later, these projections have been revised to show that the social security fund will be exhausted by 2035 if the tax rate is not increased or benefits reduced.

today will not deal with the financial problems of social security but with the more fundamental economic effects of continuing with an unfunded system. I will begin with the deadweight loss that an unfunded system causes by distorting the supply of labor and the form of compensation. I will then discuss the intertemporal welfare loss that results from depressed capital accumulation and the potential gain from shifting to a funded system.

I take it as a given, in these remarks, that the nation is politically committed to a universal (or near universal) system of retirement benefits for the aged. An alternative would be to have a means tested system that provides benefits only to those individuals who, through inadvertence, bad luck, or strategic behavior, reach old age with income and assets that are below some specified level. Although I believe that such an alternative deserves careful consideration, it lies beyond the scope of my remarks today.[5]

I. The Deadweight Loss of the Labor Market Distortions[6]

The social security payroll tax distorts the supply of labor and the form of compensation. Moreover, although the link between the social security taxes that individuals pay and their subsequent benefits means that the statutory payroll tax rate overstates the effective individual marginal tax rates, the mandatory social security contributions are nevertheless real taxes with very substantial deadweight losses. These losses are inevitable because of the low return implied by the

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[5]See Feldstein (1987) for an analysis of the conditions under which an unfunded means tested system would provide a higher level of social welfare than an unfunded universal program. It would be desirable to extend this analysis to include the possibility of funding both alternatives.

[6]I do not discuss the distortion to the retirement decision because that could be remedied by eliminating the retirement test and by other changes within the unfunded system.

pay-as-you-go character of the unfunded social security system.

Let me explain. Unlike private pensions and individual retirement accounts, the social security system does not invest the money that it collects in stocks and bonds but pays those funds out as benefits in the same year that they are collected.[7] The rate of return that individuals earn on their mandatory social security contributions is therefore far less than they could earn in a private pension or in a funded social security system. As Paul Samuelson (1958) first taught us nearly forty years ago, an unfunded social security program with a constant tax rate provides a positive rate of return which, in equilibrium, is equal to the rate of growth of the social security payroll tax base. The average annual rate of growth of real wages and salaries since 1960, 2.6 percent, is therefore a reasonable estimate of what an unfunded social security program can yield over the long-term future.

I might just note that, in contrast to this 2.6 percent potential future yield, the rate of return on social security contributions since the inception of the program has been kept artificially high by the sharp increase in the social security tax rate.[8] The combined employer-employee rate rose from just 2 percent in 1940 to 3 percent in 1950, 6 percent in 1960, 10 percent in 1980 and 12 percent since 1988. Thus, those who got in on the ground floor of the social security program and are now retired paid taxes at relatively low rates but are receiving benefits that are financed by a much higher tax rate on current employees. The resulting double digit return on social security contributions has

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[7] Although the social security system has been accumulating a fund since 1983 to smooth the path of tax rates, more than 90 percent of payroll tax receipts are still paid out immediately as benefits and the assets in the social security trust fund are less than 5 percent of the social security liabilities.

[8] The Samuelson analysis shows that the rate of return is equal to the rate of growth of the tax base plus the rate of growth of the tax rate.

sustained political support for the existing system. But such a sixfold increase in tax rates cannot happen again.[9]

In contrast to the 2.6 percent equilibrium return on social security contributions, the real pretax return on nonfinancial corporate capital averaged 9.3 percent over the same 35 year period since 1960.[10] That's the return that each individual's social security account could have earned in a fully funded government system or in a privatized system if the government credited the corporate tax receipts back to each account. The difference between the 2.6 percent social security return and that 9.3 percent real return implies that mandatory contributions to an unfunded social security plan are real taxes with a very substantial deadweight loss.[11]

A simplified example will indicate the magnitude of the implied tax wedge. Consider an employee who contributes $1000 to social security at age 50 to buy benefits that will be paid at age 75. With a 2.6 percent yield, the $1000 grows to $1900 after the 25 years. In contrast, a yield of 9.3

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[9]The tax rate increases that are projected for the next 50 years are needed just to offset the changing demographic structure and do not imply higher rates of return. Indeed, the rapid aging of the population and other recent changes imply that the return may be significantly lower than 2.6 percent for the current younger generation of employees.

[10]This 9.3 percent return combines profits before all federal, state and local taxes with the net interest paid. The method of calculation, described in Feldstein, Poterba and Dicks-Mireaux (1983), has been applied to the more recent data in Rippe (1995).

[11]In practice individuals do not earn the full 9.3 percent pretax rate of return even on retirement saving. Individual retirement accounts and private pension plans earn that return net of federal, state and local corporate taxes. Since those taxes averaged 42 percent of the pretax return (Rippe, 1995), the real net yield available to savers has been about 5.4 percent. In principle however a funded retirement system could deliver the full 9.3 percent pretax return to each individual saver. But even the lower 5.4 percent net return implies that the social security contributions are a substantial tax.

percent would allow the individual to buy the same $1900 retirement income for only $206.[12] Thus, forcing individuals to use the unfunded system dramatically increases their cost of buying retirement income. In the current example, a funded plan would permit the individual to buy retirement income at just 21 percent of the price that he must pay in the unfunded program, allowing the 12 percent social security tax rate to be replaced by a 2.5 percent contribution. The remaining 9.5 percent excess mandatory contribution is a real tax for which the individual gets nothing in return.[13]

The deadweight loss caused by this 9.5 percent tax is much larger than you might imagine. It is not the "small triangle" that typically comes to mind when we think of deadweight losses. Moreover. the size of the deadweight loss does not reflect the traditional low elasticity of labor supply that we associate with taxes on labor income. Let me explain both of these.

First, because the social security payroll tax is imposed on top of federal and state income taxes, the deadweight loss is not a small triangle but a much larger trapezoid. With a federal marginal tax rate of 28 percent (for single individuals with taxable incomes over $23,000 and married couples with combined incomes over $38,000) and a typical state income tax rate of 5 percent, the social security tax comes on top of an initial 33 percent marginal income tax rate.[14] A little arithmetic

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[12]With a 5.4 percent net rate of return, the individual can buy that $1900 retirement income for $510, about half of the cost with the unfunded social security program.

[13]The extent of the effective tax depends on the taxpayers age (or, more generally, on the amount of time that will elapse between the payment of the tax and the receipt of the benefit). Replacing the 50 year old man in the example with a 40 year old man who has 35 years until retirement raises the net tax from 9.5 percent to 10.7 percent while raising the age of the individual to 60 reduces the net tax to 7.3 percent.

[14]The combination of the 33 percent rate and the 9.5 percent net social security tax implies a 42.5 percent rate. However, since half of the 9.5 percent is paid by employers, the marginal tax rate on the full pretax marginal product of labor is 42.5/1.0475 = 40.6 percent.

shows that the incremental deadweight loss that results from the additional 9.5 percent net social security tax is equal to 4.7 percent of the product of the payroll tax base and the compensated elasticity of that tax base with respect to the net of tax share.[15] That's about ten times as large as the deadweight loss that would result if the social security tax were the only tax.

That brings me to the second reason why the deadweight loss may be substantially larger than you think. The payroll tax distorts not only the number of hours that individuals work but also other dimensions of labor supply like occupational choice, location, and effort. It also distorts the form in which compensation is taken, shifting taxable cash into untaxed fringe benefits, nice working conditions, etc.. These distortions to the form of compensation are in effect distortions to the individual's pattern of consumption. They are, dollar for dollar, as important as the distortions to labor supply. In a recent paper (Feldstein, 1995b), I showed that the deadweight loss caused by this full range of distortions -- the number of working hours, the broader dimensions of labor supply, and the pattern of consumption implied by the form of compensation and by the use of tax deductions -- can be evaluated quite simply in the traditional Harberger framework by using the compensated elasticity of taxable income (with respect to the net of tax share) in place of the usual compensated elasticity of labor supply. Because there are so many aspects of behavior that affect

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[15] Browning (1987) showed that, when the relevant behavioral elasticity is measured in the presence of the tax, the original Harberger (1964) formula for the deadweight loss of a tax with marginal tax rate t on a wage base of wL must be modified to: $DWL = 0.5\ \varepsilon\ t^2\ wL\ /\ (1 - t)$ where ε is the compensated elasticity of the tax base (wL) with respect to the marginal net of tax share, 1 - t. The increase in the deadweight loss because the marginal tax rate is at t_2 rather than t_1 is therefore $\Delta DWL = 0.5\ \varepsilon\ (t_2^2 - t_1^2)\ wL\ /\ (1 - t_2)$. Thus a pure payroll tax of 9.5 percent with no other tax present would induce a deadweight loss of $0.0045\ \varepsilon\ wL$. But in the presence of a preexisting income tax, the 9.5 percent payroll tax raises the deadweight loss by $\Delta DWL = 0.047\ \varepsilon\ wL$.

taxable income, this elasticity (and therefore the associated deadweight loss) is much larger than the traditional supply elasticity of working hours.

To estimate the elasticity of total taxable income with respect to the net of tax rate, I studied the tax returns of a panel of taxpayers before and after the 1986 Tax Reform Act (Feldstein, 1995c). These data imply a range of elasticity estimates between one and 1.5, all much larger than the traditional labor supply elasticity.[16]

This elasticity of the income tax base is likely to exceed the elasticity of the social security payroll tax base because itemized deductions and changes in portfolio income do not influence the base of the payroll tax. To be very conservative, I will therefore assume for the current calculation that the relevant compensated elasticity of the payroll tax base with respect to the net of tax share is only 0.5.

Putting these pieces together implies that the deadweight loss due to the net social security tax is about 2.35 percent of the social security payroll tax base, a deadweight loss in 1995 of about $68 billion.[17] This deadweight loss is about one percent of GDP and nearly one-fifth of total social

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[16]These estimates relate to the experience of taxpayers with 1985 incomes over $30,000 and may not be appropriate for the entire population. A similar study by Gerald Auten and Robert Carroll (1994), using a much larger set of panel data that is only available inside the Treasury Department, estimated the elasticity to be 1.33 with a standard error of 0.15. In a more recent study (Feldstein and Feenberg, 1995), Daniel Feenberg and I used the 1993 tax rate increases to estimate the elasticity implied by the experience after the 1993 tax rate increases. We found a short-run compensated elasticity of 0.74, although the interpretation of this is clouded by the lack of panel data and by transition issues.

[17]Total wages taxable by the OASDI payroll tax in 1992 were $2.5 trillion. Scaling this up to 1995 level by the increase in total wage and salary disbursements implies a 1995 tax base of $2.9 trillion. Since the payroll tax applied only to wages up to $61,200 per person in 1995, this $2.9 trillion should be reduced by the entire income of the individuals who earn $61,200 or more (for whom the payroll tax has no marginal tax consequence) and not just by the portion of

security payroll tax revenue. It increases the deadweight loss of the personal income tax by 50 percent.

In practice, the deadweight loss of the payroll tax is exacerbated by the haphazard relations between benefits and taxes that result from existing social security rules. For example, because benefits are based on the highest 35 years of earnings, most employees under age 25 receive no additional benefit for their payroll taxes. Because many married women and widows claim benefits based on their husbands' earnings, they also often receive no benefit in return for their payroll taxes. Because there is no extra reward for taxes paid at an early date, the effective tax rate on younger taxpayers can be a substantial multiple of the tax rate of older employees. Indeed, older men who are married can actually face a negative marginal social security tax rate, receiving more than a dollar in actuarially expected future benefits for every dollar that they now pay in payroll taxes (Feldstein and Samwick, 1992). The social security rules are so complex and so opaque that many individuals may simply disregard the benefits that they earn from additional working, therefore acting as if the entire payroll tax is a net tax no different in kind from the personal income tax.

The extra deadweight loss that results from these very unequal links between incremental taxes and incremental benefits would automatically be eliminated in a privatized funded system with individual retirement accounts. It can, however, also be eliminated within the existing unfunded system by creating individual social security accounts for each taxpayer (as James Buchanan (1968) suggested many years ago), crediting the account with the individual's tax payments and imputing

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their incomes over $61,200.

the average pay-as-you-go return of 2.6 percent.[18] But the labor market distortions and the resulting deadweight loss that result from the low rate of return in an unfunded system cannot be eliminated without shifting to either a funded public system or a privatized system of individual retirement accounts.[19]

II. The Welfare Loss of Reduced National Saving

The deadweight loss that results from labor market distortions is not the only adverse effect of an unfunded social security system or even the largest one. Even if there were no distortions to the labor supply or to the form of compensation (that is, even if the compensated elasticity of the tax base with respect to net of tax rate were zero), each generation after the initial one would lose by being forced to participate in a low-yielding unfunded program, i.e., by being forced to accept a pay-as-you-go implicit return of 2.6 percent when the real marginal product of capital is 9.3 percent. Even though capital income taxes now prevent each individual from receiving that 9.3 percent on his own savings, the public as a whole does receive that full return; what individuals do not receive directly, they receive in the form of reductions in other taxes or increases in government services.

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[18]Tax payments or mandatory contributions of husbands and wives could be pooled and divided into two separate accounts, thereby providing protection in case of divorce. A fraction of the contributions could be automatically devoted to the purchase of life insurance. I will not explore these important issues further in the present talk.

[19]Auerbach and Kotlikoff (1987) and Kotlikoff (1995) examine a special model in which the labor market distortions can be eliminated in an unfunded system by having a higher marginal link of benefits to taxes than the average benefit-tax ratio. They achieve this with a lump sum tax on all employees. This creates no problem in their analysis since all employees are assumed to have the same income. In practice, however, a lump sum tax that is large enough to eliminate the marginal payroll tax distortion would make the social security payroll tax very regressive.

The extent to which an unfunded social security system causes a decline in national capital income and economic welfare depends on how individual saving responds to social security taxes and benefits and on how the government acts to offset the reductions in private saving. Let's look at some facts.

An individual who has had average earnings during his entire working life and who retires at age 65 with a "dependent spouse" now receives benefits equal to 63 percent of his earnings during the full year before retirement. Since the social security benefits of such an individual are not taxed, those benefits replace more than 80 percent of peak preretirement net-of-tax income. Common sense and casual observation suggest that individuals who can expect such a high replacement rate will do little saving for their retirement. Such saving as they do during their preretirement years is more likely to be for precautionary balances to deal with unexpected changes in income or consumption. Not surprisingly, the median financial assets of households with heads aged 55 to 64 was only $8,300 in 1991, substantially less than six months income. Even if we look beyond financial wealth, the median net worth (including the value of the home) among all households under 65 years of age was only $28,000.

To get a sense of the order of magnitude of the annual loss, it's helpful to begin with the simplest case in which each dollar of social security wealth reduces real private wealth by a dollar.[20] Since the foregone private wealth would have earned the marginal product of capital while the unfunded social security system provides a return equal to the growth of aggregate wages, the population incurs a loss equal to the difference between those two returns. With a marginal product

[20] I will discuss the evidence about the effect of social security on saving below.

of capital of 9.3 percent and a social security return of 2.6 percent, the annual loss of real income is 6.7 percent of social security wealth. The social security wealth of $11 trillion in 1995 implies an annual loss in that year of $730 billion or more than 10 percent of total GDP.

Of course, this loss is not directly comparable to the deadweight loss associated with the distortions to labor supply and to the form of compensation. Although this loss of investment income affects all generations that pay social security taxes, a full welfare evaluation requires comparing these losses to the gain of the initial generation of retirees who received benefits without making any contribution.

More generally, this massive potential loss must be qualified by addressing three questions. First, how much does the social security system actually depress real capital accumulation? The capital income loss occurs only to the extent that the capital stock would be higher with private saving or a funded program. Second, how should risk be taken into account in evaluating the loss of real income per dollar of foregone capital accumulation? And, third, how should the windfall gain to the initial generation that received social security benefits without making any contribution be balanced against these subsequent losses? I will deal briefly with each. Then I will turn to the potential benefit of shifting to a privatized funded social security program.

III. The Induced Change in National Saving

To assess the effect of the existing social security system on national saving we must recognize that social security affects public saving as well as private saving. Consider first the effect on public saving. The official surplus of the social security fund in fiscal year 1995 was $69 billion. To what extent does this social security surplus actually increase real national investment? The common criticism, that such a surplus does not raise real investment because it is invested

exclusively in government bonds, is incorrect. If the social security trust fund buys government bonds that would otherwise have been sold to the public, it prevents an equal amount of crowding out and thereby does raise the level of real investment.

The critical issue is therefore how the existence of the social security surplus affects the size of the overall (unified) budget deficit. The current budget discussions about achieving a balanced budget in the year 2002 use the projected social security surplus of $111 billion in that year to offset projected deficits elsewhere in the budget. If the goal of a balanced budget in 2002 would have been set even if there were no projected social security surplus, then the existence of the surplus does not reduce the projected total budget deficit and therefore does not affect the projected future national savings available for investment. But if, as seems more likely, in the absence of a social security surplus, Congress and the President would have targeted a deficit in 2002 (with budget balance in some later year), then the projected social security surplus does increase projected national saving to some extent although less than the full amount of the projected surplus.

Similarly, the actual deficit in 1995 would probably have been larger without the $69 billion social security surplus, but not $69 billion larger because Congress and the president would have enacted other legislation to reduce the budget deficit. Thus, some part, but only some part, of the $69 billion current social security surplus probably does help to offset the decline in private saving. But since the $69 billion annual surplus is only one-sixth of social security receipts and the entire social security trust fund is now less than 5 percent of social security wealth, the offsetting impact of public saving is not a major consideration.

The key issue is therefore the extent to which social security wealth reduces private saving. Economic theory alone cannot provide an unambiguous answer. Even if all individuals were rational

life-cycle savers, each dollar of social security wealth would not necessarily replace exactly a dollar of real wealth. To the extent that the income-tested character of social security benefits induces earlier retirement, individuals will save more than they otherwise would. The relative importance of this induced retirement effect and of the more basic wealth replacement effect will vary from individual to individual (Feldstein, 1974). Social security also affects private saving through an income effect and by providing a real annuity. My colleague Robert Barro argues that individuals who have operative utility-maximizing bequest motives offset fully the impact of social security wealth by increasing their saving in order to compensate future generations for the tax burdens implied by the social security liabilities (Barro, 1974). I doubt that effect is empirically very important.[21] More important, I believe, is that an unknown number of individuals who are irrational or myopic may not respond at all to the provision of social security benefits.

So the extent to which social security wealth substitutes for private real wealth accumulation is an empirical issue. A substantial amount of research has been done on this question. Like every other important and complex issue in economics, different studies do not all point to the same conclusion. That is inevitable in empirical economics. As I have argued in a different context (Feldstein, 1982), all empirical specifications in economics are false models, oversimplifications that cannot be literally true. Statistical estimates must therefore be interpreted with a sensitivity to

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[21]My own judgement on this "Ricardian equivalence" issue is that very few of the individuals who are affected by social security have operative bequest motives. Because future generations can be expected to have higher real incomes, even parents who include their children's consumption or utility in their own utility functions may prefer to receive gifts rather than to make bequests. If children do not wish to support their parents, the result is a corner solution in which loving parents do not compensate their children when the value of the social security liability increases. On the empirical irrelevance of Ricardian equivalence, see for example Altonji et. al. (1992). See also Bernheim (1989).

potential biases, simplifications, data quality problems, and the like. In the end, the researcher must make a judgement based on all of the evidence rather than by applying traditional theories of statistical inference to each individual study.

What then does the evidence tell us about the effect of social security on private saving? At the most basic level is the fact, to which I have already referred, that most households accumulate little or no financial assets. This is consistent with a rational decision to substitute social security benefits for private wealth accumulation (Diamond, 1977) but it could also be interpreted as evidence that individuals are completely myopic, providing nothing for their old age regardless of whether or not there are social security benefits. However, studies based on cross-sections of household data[22] support the substitution hypothesis. Although there remain serious problems of statistical identification and data quality and a wide range of parameter estimates, I interpret the cross-section evidence as implying that each extra dollar of social security wealth replaces about 50 cents of private wealth accumulation. Finally, there are the time series studies linking social security wealth to aggregate private saving and consumption.[23] I recently reestimated the specification in my 1974 paper using time-series data through 1992 and tested some of the specifications that others had examined with earlier data (Feldstein, 1995a). The new parameter values are remarkably close to my original estimates and imply that the existing social security wealth reduces overall private saving by nearly 60 percent.

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[22]These include studies by Blinder, Gordon and Wise (1974), Diamond and Haussman (1984) and Feldstein and Pellechio (1979).

[23]See for example Barro (1978), Esposito (1978), Feldstein (1974)and Leimer and Lesnoy (1982)..

Although none of these is a definitive study that establishes a precise substitution of social security wealth for other household wealth, I believe that taken together these studies do imply that the social security program causes each generation to reduce its savings substantially and thereby to incur a substantial loss of real investment income.[24]

That the displacement of private saving by social security is less than complete reduces the loss that each generation incurs from the imposition of an unfunded program. But even if each dollar of social security wealth displaces only 50 cents of private wealth accumulation, the annual loss of national income would exceed five percent of GDP.[25]

However, in assessing the aggregate welfare impact of the social security program, the loss that results from the depressed level of real capital accumulation must be balanced against not only

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[24] The decline in the size of the domestic capital stock depends also on the extent to which a lower rate of saving induces an increased net inflow of capital from abroad. If capital flowed internationally to maintain the same rate of return everywhere, a decline in the U.S. saving rate would induce an equal offsetting inflow from abroad. Although the net of tax return on this capital would go to the foreign suppliers of this capital, the U.S. government would collect taxes on the equity portion of this investment and the U.S. public would gain a corresponding amount. The evidence suggests however that the international capital market is sufficiently segmented that relatively little capital flows to replace the lost US saving. See Feldstein and Horioka (1980), Feldstein (1994) and Mussa and Goldstein (1993).

[25] Increasing the capital stock by half of the 1995 net social security wealth of $11 trillion would raise capital income by $511 billion or about 7 percent of GDP if the rate of return remained unchanged at 9.3 percent. Such a large increase in the capital stock would of course reduce the marginal product of capital. If all of the increase in the capital stock went into the domestic capital stock (i.e., if there were no change in international capital flows), a Cobb-Douglas production function with a labor coefficient equal to the share of compensation in national income implies that the marginal product of capital would be depressed from 9.3 percent to 7.3 percent if the incremental capital went only into the business sector (i.e., excluding owner occupied housing) and to 7.9 percent if the entire capital stock were increased. Of course, the lower return to capital would be matched by a higher return to labor. An increase in the capital stock equal to half of net social security wealth would raise the capital stock by one-fourth and would therefore raise national income by 5.7 percent.

the windfall gain of the first generation of retirees but also against the gain in protection to those myopic individuals who would otherwise have saved too little for their old age.[26] I shall not pursue that issue today but will ask instead what the loss is from using an unfunded program to provide benefits instead of a funded program. I will then examine what the gain would be in switching from our existing unfunded program to a funded one (in the form of a mandatory private program). In order to do so, it is necessary to consider first how the returns on real capital and on social security contributions should be adjusted for risk.

IV. Adjusting Returns for Risks

Until this point in my remarks I have described the loss that results from substituting a pay-as-you-go program for real capital accumulation as the difference between the expected marginal product of capital and the expected growth of aggregate wages. Since both returns are uncertain, it would be appropriate to replace these expected yields with lower certainty equivalence values.

The certainty equivalent social rate of return on real capital depends on how the risk in that

[26] If public policy is committed to an unfunded social security program, setting the appropriate level of benefits requires balancing the protection of the myopic undersavers against the loss to others that results from replacing high yield real capital accumulation with the low implicit social security yield. I have examined this optimization problem with the help of some simple models (Feldstein, 1985) and concluded that, with realistic estimates of the yield on capital and the return on the pay-as-you-go social security system, the replacement ratio of social security benefits to past earnings should be very much lower than it is in the current system. Indeed, even if all individuals substantially discount their utility during retirement when making their preretirement saving decisions, the optimal level of social security benefits may be zero, i.e., the loss in real income from reduced real saving may outweigh the benefit of the social security program in raising retirement income. This issue is of course closely related to the question of whether benefits should be means tested; see Feldstein (1987).

return is shared through the tax system between individual savers and the broader public.[27] Taxes paid by corporations have equaled about 42 percent of the 9.3 percent real pretax return over the past 35 years (Rippe, 1995), implying a net 5.4 percent average return to savers before personal taxes[28] and a 3.9 percent return collected by the government. Variations in this source of government revenue are reflected in the short run in the budget deficit and, in the longer run, in changes in taxes on all incomes (most of which are employment incomes) and in government spending.

I assume that most individuals do not invest in stocks and bonds because the costs of learning how to make such investments outweigh the small gains the would result relative to bank deposits on their very limited financial assets. The very small variations in net income imposed on them through their sharing in the tax on investment income can therefore be ignored, taking the mean value of that income as the certainty equivalent.[29] It is reasonable therefore to use the mean value (of 3.9 percent) as the relevant certainty equivalent for the part of the return to capital that is collected by the government.

What is the appropriate certainty equivalent for the 5.4 percent return that accrues to

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[27]This issue is discussed in Feldstein (1995d). Arrow and Lind (1970) explain that the fundamental principle for the evaluation of risky public expenditures is that the value of benefits should be reduced if a substantial risk is borne by the individual but that the expected value is an appropriate certainty equivalent for the part of the benefits and costs that the government spreads to all taxpayers through the tax system.

[28]I assume that the alternative to the unfunded program would be a funded program in which the individual saver would get a return net of the corporate tax but not subject to any personal taxes. If additional personal taxes were levied, the certainty equivalent would get even closer to the expected value.

[29]This implicitly assumes that the variation in portfolio income is uncorrelated with shocks to their income and consumption.

individual savers? A relatively conservative choice is the real yield on 10-year government bonds, a return of 2.5 percent between 1960 and 1994. Combining the 3.9 percent return collected in taxes and this 2.5 percent certainty equivalent return received by individuals gives a total certainty equivalent return of 6.4 percent instead of the expected return of 9.3 percent.

It is less clear how the 2.6 percent return of the unfunded social security program should be adjusted for risk. The future return that an individual will receive on his or her social security taxes depends on the growth of aggregate real wages, on the changing age structure of the population, and on political decisions about taxes and benefits. During the period since 1960, the forward looking increase in aggregate real wages for completed 20-year periods varied from a low of 1.5 percent to a high of 3.0 percent. Changes in demographic structure added to the fluctuations in available returns. And in recent years, the value of future social security benefits has been decreased by subjecting them to tax and by increasing the retirement age at which full benefits are paid.

One possibility would be to assume that the return on social security is as uncertain as the real return on investment in plant and equipment, suggesting that the appropriate difference between the two certainty equivalents may be the same as the difference between the two mean values, or 6.7 percent. An alternative extreme assumption would be to adjust the return on capital for risk but to make no adjustment in the return on the social security program, implying a risk-adjusted difference of only 3.8 percent, i.e., the difference between the 6.4 percent certainty equivalent yield on real capital and the 2.6 percent expected return on social security wealth. Note that even this low 3.8 percentage point difference in returns implies that substituting the existing $11 trillion unfunded social security wealth for a funded program of equal size implies a risk-adjusted income loss of

nearly six percent of GDP.[30]

In short, while risk adjustment might change the specific magnitude of the annual loss, even with a very conservative risk adjustment, the loss of having a funded rather than an unfunded program remains very substantial.

V. Initial Gains and Subsequent Losses

I turn now to the issue of how to balance the gain to the initial generation of beneficiaries in an unfunded system who receive benefits without contributing and the losses to all future generations who forego the higher yield that would be earned on real capital.[31]

When a social security program first begins, the government collects an amount in taxes which it distributes to the then current retirees if the program is unfunded or which it invests in the national capital stock if the program is funded. The same thing happens again whenever the tax rate is increased to finance a relative increase in benefits or an expansion of coverage. To simplify my comments today, I will ignore the role of subsequent expansions and speak only of the windfall benefits to the initial generation.

If each dollar collected by an unfunded program reduces national saving by a dollar relative

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[30]See footnote 25. An $11 trillion increase in the 1995 capital stock would raise the capital stock by 50 percent and, assuming a Cobb Douglas technology, would raise national income by 11 percent. Labor would receive about three fourths of this increase. This calculation ignores the risk adjustment and the offset for the implicit pay-as-you-go return on social security wealth. A 2.6 percent pay-as-you-go return on social security wealth would be about four percent of GDP.

[31]For a formal analysis of this problem, see Feldstein (1995d).

to a funded program of the same size,[32] each generation after the initial one incurs a loss that reflects the difference between the marginal product of capital and the growth of aggregate wages. The key question is whether the present value of the losses to all future generations exceeds the windfall benefit that the initial generation received without having paid any tax.

To compare these magnitudes, the future losses must be discounted at a rate that reflects the rate at which the marginal utility of consumption declines over time. The dollar loss to each subsequent generation grows at the same rate as aggregate wages . Discounting this growing stream of losses at a constant discount rate is therefore equivalent to applying a growth-adjusted discount rate -- i.e., the difference between the discount rate and the growth rate -- to a constant perpetual loss at the level incurred by the first generation of losers . Thus, the present value of the losses is equal to the taxes transferred to the initial beneficiaries multiplied by the ratio of the reduced rate of return -- i.e., the difference between the risk-adjusted marginal product of capital and the risk-adjusted social security return -- to the growth-adjusted discount rate.

Since the initial generation receives a benefit equal to the initial amount of the tax, the adoption of an unfunded plan rather than a funded plan causes a net present value loss if the return difference per dollar of foregone investment exceeds the growth adjusted discount rate. This condition is satisfied for any plausible values of the parameters, implying that the present value of the future losses exceeds the value of the initial transfer.

Consider the following example. If we adopt the very conservative procedure of risk-

[32] This assumption of one-for-one substitution simplifies by abstracting from income effects. The funded program could be a funded public program or a private program with mandatory savings replacing the social security payroll tax.

adjusting the return to private capital but making no adjustment to the return on social security taxes, the lost rate of return is 3.8 percent. The present value of the future losses therefore exceeds the value of the initial generation's windfall if the growth adjusted discount rate is less than 3.8 percent. Since the growth rate is 2.6 percent, this is satisfied if the discount rate itself is less than 6.4 percent, a condition that is certainly warranted.

With a more plausible but still very conservative high discount rate of 4 percent,[33] the risk-adjusted annual loss of 3.8 percent of displaced investment implies a present value loss of an unfunded program that is nearly three times as large (when discounted back to the start of the program) as the windfall benefit to the initial retirees.[34] [35]

VI The Potential Gain from Privatization

It is natural to ask therefore whether a large gain in economic welfare could be achieved by shifting now to a funded system. Several governments around the world are following Chile's

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[33]The discount rate should reflect the decline in the marginal utility of per capita consumption that results from the growth of per capita real wages. With per capita real wage growth at about 1.6 percent a year, the appropriate discount rate is less than the critical value of 6.4 percent if the elasticity of the marginal utility function is less than the extremely high value of four. An elasticity of 2 for example, which is high enough to imply that the marginal utility of consumption is halved about every 45 years, corresponds to a discount rate of 3.2 percent. With aggregate wage growth of 2.6 percent, this implies a growth adjusted discount rate of only 0.6 percent.

[34] Recall that to simplify the discussion I have assumed that there was only one initial windfall. The actual loss reflects all subsequent program expansions as well.

[35] A discount rate of 4 percent implies a growth-adjusted discount rate of 1.4 percent. The present value of the losses is thus 3.8/1.4 = 2.7 times the initial transfer. With a more plausible discount rate of 3.2 percent, the corresponding loss would be 6.3 times the initial transfer. And if the return to social security is given the same risk adjustment as the return to real capital, the loss becomes (9.3 - 2.6)/ 0.6 = 11.2 times the initial transfer.

example and making such a transition by privatizing their social security programs.[36] Although the details differ, the essential feature of such privatizations is to require each employee to have a retirement account into which the employee or his employer must make regular periodic contributions that are then invested in stocks and bonds. The government recognizes its obligations at the time of privatization to existing retirees and employees by depositing in these retirement accounts new government bonds equal to the present value of the benefits to which the individual is then entitled on the basis of past contributions to the unfunded system. Funds in these new retirement accounts can be used to purchase annuities, or withdrawn gradually when the individual reaches retirement age, or bequeathed to a spouse or other heirs.

A skeptic might ask whether this really accomplishes anything since it merely converts the existing unfunded social security obligations into explicit government debt with the same present value. That skepticism would be warranted in a static economy but is not appropriate when economic growth is continually enlarging the size of the social security liability. Shifting from an unfunded program to a funded one is an application of the general principle that, when you discover you're

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[36]The use of the term "privatize" is ambiguous and raises political objections if it suggests a complete abrogation of government responsibility for the income of the aged. The benefits of a funded system that I discuss in this lecture refer to capital accumulation and to having separate accounts that link the mandatory contributions of each individual to subsequent benefits. I take the essence of privatizing to be whether individuals are also given control over their investments. In a funded but not privatized system, the government would have to invest in private stocks, bonds and mortgages. There are obvious reasons for not wanting the government to acquire very large investments in individual private companies. Although the administrative costs may be higher when individuals have control over their investments, major U.S. mutual funds have reduced their expenses to less than one-quarter of one percent of assets on equity funds and to even less on fixed income funds. Even in a private system, individuals might be constrained on the mix of assets in which they invest and a general safety net might be provided to protect individuals whose investments did not produce adequate retirement income. Consideration of these issues lies beyond the scope of this lecture.

in a hole, the first thing to do is to stop digging. Shifting to a funded system eliminates the future losses associated with future increases in the size of social security wealth.

In the first year after the privatization of a pay-as-you-go system, there is no increase in the capital stock because the government would have to borrow all of the mandatory saving to pay benefits to existing retirees. But as time passes, the amount of net capital investment grows (because the mandatory saving rises with the number of employees and their average incomes) while the net social security debt that is explicitly recognized at privatization remains constant. As a result, the capital stock grows and with it the incremental income.

The net effect in each year consists of two parts: a gain equal to the real risk-adjusted return on the increase in the capital stock and a loss of the implicit social security return on the taxes paid. As the incremental capital stock grows, the net effect shifts from negative to positive and then increases without limit. If the capital stock grows by the amount of the mandated saving (in excess of the initial social security wealth), the present value of this gain at the time of privatization -- using a 6.4 percent risk adjusted return on capital, a 2.6 percent return on social security, and a 4 percent discount rate -- is nearly twice the current value of the unfunded program. Approximating the current value of the unfunded program by the social security wealth implies a potential present value gain of nearly $20 trillion. Even if the increase in the capital stock that results from shifting to a funded program is substantially less (because individuals reduce some private saving or because the mandated saving is less than the existing payroll tax), the potential present value gain could easily exceed $10 trillion.

It is hard to put such a large sum in perspective. It may help to note that, with the assumed discount rate and GDP growth rate, that present value gain from privatization is equivalent to about

two percent of GDP in perpetuity. But when thinking about the political economy of reform, it is also worth bearing in mind that the potential gain from the one-time political act of shifting to a funded program has such an enormous positive present value.

This is just the gain from increasing real capital accumulation. In addition, as I noted earlier in my talk, the shift to a funded program would also reduce the deadweight losses that are now caused by a payroll tax that distorts labor supply and the form of compensation. Recall that this reduction in deadweight loss is the portion that cannot be obtained by redistributing the existing implicit return but depends on raising the rate of return on social security contributions from the rate of growth of wages to the real return on capital. This $68 billion deadweight loss for 1995 corresponds to an additional 1.0 percent of GDP.

Because privatization reduces the deadweight loss in perpetuity (by one percent of GDP) and provides individuals (after the first generation) with an opportunity to earn a higher rate of return on their mandatory retirement saving, it is possible to design a transition to a funded program that leaves each generation better off than it would be with the existing program. This can be done by using additional debt to smooth the cost of the transition over more than one generation. Although each of the transition generations would pay more in a combination of taxes and mandatory saving than under the existing laws, the improved return on their funded accounts and the resulting reduction in labor market distortions, would leave them better off.

A system of payroll taxes during the transition that varies by age could increase the number of individuals who are net gainers by assigning more of the transition tax burden to those who, because they are younger, would gain more from the opportunity to invest their retirement savings at the higher rate of return.

Andrew Samwick and I are exploring yet an alternative approach to the transition problem that might make it possible to shift some or all employees from an unfunded system to a privatized funded system without raising taxes or reducing national saving. Our approach recognizes that some individuals, because of their age, financial circumstances, and preferences, would be willing to forego their current claims on social security benefits without explicit compensation and to increase their total saving in exchange for not having to contribute to the pay-as-you-go program in the future. If we are successful in our research, we will have designed a Pareto improving transition mechanism that improves the welfare of not only the current generation as a whole but also of each participating individual. But that is work in progress and a subject for another day.

For today, my primary message has been that the reform of social security, and of other implicit life cycle programs like Medicare and nursing home care, is both urgent and enormously important. The payroll tax required by the current unfunded system distorts the supply of labor and the form of compensation, raising the deadweight loss of personal taxes by 50 percent. In addition, each generation now and in the future loses the difference between the return to real capital that would be obtained in a funded system and the much lower return in the existing unfunded program. Conservative assumptions imply a combined annual loss of more than four percent of GDP as long as the current system lasts. Although the transition to a funded system would involve economic as well as political costs, the net present value of the gain would be enormous.

The rapidly deteriorating financial position of social security will eventually force politicians to deal with the problem of social security reform. The very adverse impact of the current system on a wide variety of groups -- including two earner couples, the young, and the poor -- may embolden some politicians to go beyond patching up the solvency of the current system to propose

more fundamental reforms than have been considered in the past. When the politicians are ready to act, I hope that we in the economics profession will be ready to help them.

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