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### **ABSTRACT**

Governments around the world have enacted or are currently considering fundamental structural reforms of their Social Security pension programs. The key feature in these reforms is a shift from a pure pay-as-you-go tax-financed system, in which taxes on current workers are primarily distributed to current retirees, to a mixed system that combines pay-as-you-go benefits with investment-based personal retirement accounts.

This paper discusses how such a mixed system could work in practice and how the transition to such a change could be achieved. It then analyzes the economic gains that would result from shifting to a mixed system. I turn next to the three problems that critics raise about any investment-based plan: administrative costs, risk, and income distribution. Finally, I comment on some of the ad hoc proposals for dealing with the financial problem of Social Security without shifting to an investment-based system.

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## Structural Reform of Social Security

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Governments around the world have enacted or are currently considering fundamental structural reforms of their Social Security pension programs.<sup>1</sup> The key feature in these reforms is a shift from a pure pay-as-you-go tax-financed system, in which taxes on current workers are primarily distributed to current retirees, to a mixed system that combines pay-as-you-go benefits with investment-based personal retirement accounts. Countries as different as Australia, Chile, China, Britain and Sweden have already adopted mixed systems of this type (Feldstein, 1998; Feldstein and Siebert, 2002). In the United States, President Clinton almost proposed such a plan (Elmendorf, Liebman and Wilcox, 2001) and President Bush has made it a major priority for his second term.

This paper will first explain how Social Security works now, how a mixed system could work in practice, and how the transition to such a change could be achieved. I will then discuss

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My views on this subject have benefitted from collaborative research with Jeffrey Liebman, Elena Rangelova and Andrew Samwick; references to some of our joint work appear in the references to this paper. I have also learned a great deal from the wide range of research developed in recent NBER projects on Social Security presented in Campbell and Feldstein (2001), Feldstein (1998), Feldstein and Liebman (2002c), Feldstein and Siebert (2002) and Shoven (2000). I am grateful for comments on an earlier draft of this paper by Kathleen Feldstein, Stephen Goss, Larry Kotlikoff, Jeffrey Liebman, Andrew Samwick and the editors of this Journal.

<sup>1</sup>For a more general discussion of the reform of social insurance programs, including unemployment insurance and health insurance, see my 2005 presidential address to the American Economic Association (Feldstein, 2005a).

the economic gains that would result from shifting to a mixed system. I then turn to the three problems that critics raise about any investment-based plan: administrative costs, risk, and income distribution. Finally, I comment on some of the ad hoc proposals for dealing with the financial problem of Social Security without shifting to an investment-based system.

### Social Security Today

The Social Security program in the United States now provides retirement benefits equal to about 40 percent of the final year earnings for someone who has had median earnings all his life and who retires at the normal retirement age ( now gradually increasing from 65 to 67). The replacement rate is higher than 40 percent for those with lower lifetime earnings and lower than 40 percent for those with higher lifetime earnings, although the extent of redistribution is less than generally believed. (I will return to this subject below.) After benefits begin, they are indexed to the consumer price index. An additional 50 percent of the retiree's benefit is payable to a married couple if the resulting total exceeds what they would receive based on their two separate earnings records. A widow receives the greater of her own potential benefit and the benefit to which her husband would have been entitled; the same rule applies to widowers. There is a separate program for the disabled that I will not discuss.

These retiree and survivor benefits are financed by a payroll tax, currently 10.6 percent of wages up to \$87,900 (in 2004) and divided equally between employees and employers. The maximum taxable earnings rises annually in line with average wages. This payroll tax revenue is supplemented by a transfer of the income tax revenue that results from taxing a portion of the benefits received by higher income individuals, bringing the current program receipts to 10.9 percent of taxable payroll. In addition to the 10.6 percent payroll tax for the Old Age and Survivor

Insurance (OASI) program, there is a 1.8 percent payroll tax for disability and a 2.9 percent payroll tax (with no limit on the taxable wage) for Medicare, bringing the total payroll tax rate to 15.3 percent.

Social Security is essentially a pay-as-you-go program in which current tax revenue is used to pay current benefits. Unlike a private pension, private stocks and bonds are not accumulated to pay future benefits. The revenue received by the Social Security program is technically credited to the Social Security trust fund, but any of the receipts that are not used to pay current benefits are loaned to the government to finance other government activities. Although the trust fund is therefore nominally invested in government bonds and credited with interest at a government bond interest rate, it is essentially just an accounting mechanism for keeping track of past Social Security surpluses. Since the current inflow to the trust fund exceeds the actual cost of current benefits (expected to equal to 9.1 percent of taxable payroll in 2005) , the trust fund balance is now increasing.

When annual benefits exceed the inflow to the program (excluding the interest received from the Treasury) in about 2018, the government will have to sell bonds to the public to finance benefits. That those bonds are technically associated with the trust fund does not change the fact that they will be government borrowing that increases the budget deficit and crowds out private investment. Although the political focus is on the projections that the trust fund balance will reach zero in 2044, the more important date is 2018 when the government must begin borrowing to pay benefits.

Since Social Security began in 1937, it has paid benefits to each generation of retirees that have exceeded the taxes that that generation paid while working. The implicit rate of return on

Social Security contributions is not determined by return on the trust fund investment but reflects the growth of the payroll tax base from one generation to the next. Paul Samuelson's (1958) famous overlapping generations paper explained that a pure pay-as-you-go Social Security program with a constant tax rate can pay an implicit rate of return equal to the growth rate of the tax base, since each generation of retirees is supported by a larger tax base than the one on which it paid tax when it was working.

In practice, the implicit rate of return that retirees have received on their Social Security taxes has been much greater than the growth of the tax base because the tax rate was also rising rapidly. The payroll tax was gradually raised from the initial 2 percent in 1937 to the current 10.6 percent, creating a series of windfalls as subsequent generations of retirees received benefits financed by a higher tax rate than the one that they had paid when they were working. The resulting high rates of return contributed to the political support for the program and for its increasing tax rate.

### The Politics of Reform

The projected increases in the future number of retirees per worker mean that the high implicit rates of return have come to an end. The Social Security Administration (SSA) estimates that with the 10.6 percent tax rate and the benefits projected in current law, an individual joining the labor force today would receive an implicit real rate of return of only about 2.5 percent (Social Security Administration, Office of the Actuary, 2001). Even that low rate of return is not possible in practice because the future aging of the population means that the 10.6 percent tax will not be enough to finance the benefits projected in current law. Benefits must be cut below their projected levels or taxes must be increased. In either case, the net rate of return will be reduced. Although

the retirement of the large baby boom generation that will begin during the coming decade accelerates this process, the long-term change in the ratio of retirees to workers reflects the permanent rise in life expectancy and the concurrent low birth rate. The higher cost of the pay-as-you-go benefits will continue even after the baby boom generation has passed.

The actuaries of the Social Security Administration estimate that the cost of providing the benefits specified in current law will rise from 9.1 percent of taxable payroll now to 14.5 percent in 2030, 15.4 percent in 2050, and 16.6 percent in 2075. Even with revenues from the income tax on benefits equal to 0.9 percent of payroll in 2075, the payroll tax rate would have to increase 48 percent (from today's 10.6 percent to 15.7 percent) to finance currently projected benefits with the present pay-as-you-go structure. Keeping the tax rate unchanged at 10.6 percent would require cutting benefits by nearly one-third.

This projected rise in the tax rate to 15.7 percent understates the increase that would actually be needed because the increased marginal tax rate would cause individuals to change their behavior in ways that reduce taxable wages: working less and in less remunerative occupations, taking more compensation in the form of untaxed fringe benefits and nicer working conditions, and increasing the spending that can be deducted in calculating taxable income. This induced fall in taxable wages requires not only a higher tax rate to finance Social Security benefits but also higher payroll tax rates for disability and Medicare and higher personal income tax rates to achieve the currently projected personal income tax revenue. Plausible estimates of the response of taxable wages based on recent econometric research (Feldstein, 1995a; Auten and Carroll, 1999; Gruber and Saez, 2002; Giertz, 2004) implies that tax base would shrink by about 4 percent and

the OASI payroll tax rate would have to rise to 16.4 percent instead of 15.7 percent<sup>2</sup> and that the combination of other payroll and income tax rates would have to rise by an additional 1.3 percentage points. In total, the marginal tax rate would have to rise not by 5.1 percent (from 10.6 to 15.7) but by 7.1 percent.<sup>3</sup>

The prospect of large tax rate increases or benefit reductions in response to changing demographic structures has induced governments in many countries to shift from the pure pay-as-you-go system to a mixed system that includes investment-based personal retirement accounts. (Even those countries like Chile that say that they have a pure investment-based system provide various guarantees that imply a de facto mixed system.). As I explain below, the United States could use such a mixed system to avoid the rise in the tax rate while maintaining expected retirement incomes at or above the level projected in current law.

There is no free lunch in such a reform. Avoiding a future increase in the payroll tax would require an increase in national saving during the transition. It could take the form of additional saving by individuals or an increase in government saving through less spending or higher taxes. The increased saving need not be large. The specific calculations described below reflect additional saving of about 0.6 percent of GDP.

Although avoiding a large tax increase or benefit cut is the reason for political interest in

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<sup>2</sup>This approximation assumes that the elasticity of taxable wages with respect to the marginal net-of-tax-share (i.e., one minus the marginal tax rate) is 0.5 and the income effect is 0.15.

<sup>3</sup>This is based on the current level of DI and Medicare payroll taxes that total 4.7 percent of payroll. The changes in demographic structure and in health care costs would actually raise these costs very substantially over the coming decades, implying that the decline of taxable wages implied by the higher OASI tax would cause even larger increases in the required overall tax rate.

such a reform, it would also provide economic benefits that can be analyzed separately: an efficiency gain (i.e., decreased deadweight loss) associated with reducing labor market distortions and, separately, an increased present value of consumption due to the shift to a partially investment-based system. Before discussing these disadvantages, I first describe how a mixed system could operate and the way in which the transition could be structured and financed.

#### How a Mixed System Could Work

A mixed system that combines a pay-as-you-go component and an investment-based portion could be structured in many ways.<sup>4</sup> Differences in plan design affect how the costs and benefits are distributed over different generations. The following example reflects one of the plans that Andrew Samwick and I outlined in our paper, “Potential Paths of Social Security Reform.” (Feldstein and Samwick, 2002). I focus on this particular example not because it is necessarily the best alternative but because we have done extensive calculations of its implications for future retirees and for the aggregate budget.

The plan was designed to satisfy five requirements: (1) Current retirees receive the full pay-as-you-go benefits specified in current law. (2) For all future cohorts of retirees, the combination of pay-as-you-go benefits plus the expected investment-based personal annuities will equal or exceed the benefits that current law projects for that cohort. (3) The tax rate and relative tax base will not be increased. (4) The financing solution will be permanent, implying that the Social Security trust fund in 2075 (the end of the forecast period of the Social Security actuaries) will be both positive and growing. (5) There will be no use of existing general revenue to finance

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<sup>4</sup>See for example the President’s Commission to Strengthen Social Security (2001) and chapter 6 of the Economic Report of the President for 2004.

Social Security benefits.

The increased national saving during the transition is achieved by individual out-of-pocket contributions to personal retirement accounts that raise the nation's stock of capital through investments in a mixture of stocks and bonds.<sup>5</sup> This increase in the capital stock generates the additional real income in the future that permits retirement incomes to be maintained with less reliance on taxes.

When the system is fully phased in, each employee would continue to participate in the pay-as-you-go system and, separately, would contribute to an investment-based personal retirement account. There would be no change in the current 10.6 percent payroll tax for the Old Age and Survivor Insurance program. The disability program would also continue to be financed and managed separately as it is now<sup>6</sup>. Of the 10.6 percent OASI tax, the government would transfer 1.5 percent to the personal retirement accounts. The remaining 9.1 percent payroll tax revenue plus the transfer of the income tax collected on Social Security benefits would, by 2075, only be able to finance 60 percent of the "benchmark" benefits specified in current law. To maintain total retirement income at the benchmark level, the personal retirement account annuities would therefore have to be equal to at least 40 percent of the benchmark benefits.

The personal retirement accounts would be funded by a combination of the 1.5 percent that was transferred from the payroll tax plus an additional 1.5 percent that individuals would

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<sup>5</sup>Feldstein and Samwick (2002) also analyzed several other plans that do not maintain all of these requirements. In particular, we examined plans that require borrowing general revenue funds during the transition and show how that borrowing can eventually be repaid.

<sup>6</sup>The Feldstein-Samwick quantitative analyses of alternative reforms all leave the disability insurance (DI) unchanged, using the tax revenue projected by the Social Security actuaries to meet the obligations of the DI program.

contribute out-of-pocket on a voluntary basis.<sup>7</sup> Individuals would be given an incentive to make this contribution to their accounts by a matching payment, that is, anyone not contributing 1.5 percent out of pocket would not receive the 1.5 percent transfer of payroll tax. That incentive might be varied by income class with higher matching rates for those in lower income groups. Research on private business experience with 401(k) plans shows that participation rates can be substantially increased by making participation the “default” option (Choi, Laibson and Madrian, 2004). This would mean that the employer would automatically deduct an additional 1.5 percent of payroll for each employee (in addition to the current tax) but employees who chose not to participate could apply for a refund of the 1.5 percent when they file their income tax return. The calculations summarized below assume that all employees contribute.

Personal retirement account balances would have to be invested in diversified equity and bond mutual funds, similar to the investments allowed in 401(k) plans. Each individual would choose an investment firm for his personal retirement account from an approved list of mutual fund managers, banks, and insurance companies. The individual could make this designation on his annual tax return and could change this annually. Rules might specify minimum and maximum percentages for equity and debt. The calculations presented below assume that 60 percent of the personal retirement account balances are invested in a broad equity mutual fund index (the Standard & Poor’s 500) and 40 percent in a corporate bond fund (equivalent to the Lehman Baa bond index). The risk implications of these investments and the possibilities for reducing risk are discussed below.

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<sup>7</sup>This equal contribution to the personal retirement accounts is only one possibility. Feldstein and Samwick (2002) also consider plans that use general revenue or government borrowing in place of the personal saving.

If an individual dies before reaching retirement age, the assets in his personal retirement account would be bequeathed to heirs, perhaps with special rules to protect spouses. Individuals who are divorced might be required to pool their two accounts at the time of divorce (or the increase in those accounts during their married years) and divide the total equally.

At retirement age, the individual might be given the choice of annuitizing the accumulated fund or taking out all or some in cash. The amount taken out in cash could be limited by requiring that the remaining annuity provides some minimum replacement of previous earnings.

Continuation of the traditional pay-as-you-go system implies that a substantial pay-as-you-go annuity would remain even if the individual took the entire personal retirement account accumulation in cash; when the mixed system is fully phased in, the pay-as-you-go benefits would remain at 60 percent of the currently projected “benchmark” benefits. Policy decisions on the degree to which annuitization should be mandatory should depend on further study of the potential self-selection problem, that is, the extent to which annuities would be bought by those who have above average life expectancy (McCarthy and Mitchell, 2003; Brown, Mitchell and Poterba, 2000, Finkelstein and Poterba, 2004).

The Feldstein-Samwick analysis summarized below assumes complete annuitization starting at age 67 so that the combination of the personal retirement account annuity and the reduced pay-as-you-go annuity can be compared to the benchmark pay-as-you-go benefits scheduled in current law. We consider a “variable annuity” in which funds are always invested in the same 60:40 mix of stocks and bonds. The annuity is subject to a “ten year certain” provision that continues payments for at least ten years after retirement even if the individual dies during that interval. Both the form of investment and the use of the ten-year certain annuity could of course be made matters of individual discretion.

To evaluate this mixed system, Feldstein and Samwick (2002) used the demographic and economic projections of the Social Security actuaries (2001 Social Security Trustees Report). A portfolio invested 60 percent in the Standard and Poors 500 index of common stock and 40 percent in a portfolio of corporate bonds during the fifty year period through 1995 had a mean real return of 6.9 percent.<sup>8</sup>

Feldstein and Samwick (2002) shows that the expected benefits for individuals with average lifetime earnings who reach normal retirement age in 2050 would be 121 percent of the benchmark benefits scheduled in current law, consisting of a personal retirement account annuity equal to 61 percent of the benchmark benefit and a pay-as-you-go benefit equal to 60 percent of the benchmark benefit. By 2075, the total would reach 135 percent of benchmark benefits with 75 percent of the benchmark coming from the annuity. The OASI trust fund balance would remain positive in every year; by 2075 it would be 55 percent of payroll and rising in a way that would allow either an increase in benefits, a reduction of the pay-as-you-go tax, or a decrease in personal saving contributions to the personal retirement accounts.

The assets accumulated in the personal retirement accounts would reach 125 percent of

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<sup>8</sup> More recent calculations show that the mean real return for the period 1945 through 2003 remained at 6.9 percent. The mean real return on equities was 8.7 percent and the mean real return on the bond index was 4.4 percent, implying that a 60:40 weighted average had a mean of 6.9 percent. Although the future returns might not be as favorable, the relatively stable historic average pretax marginal product of capital in the corporate sector of about 9 percent (Poterba, 1998) and an effective federal-state-local tax on corporate capital income of less than 30 percent imply a real return of more than 6 percent to be divided between debt and equity investors before personal taxes.

The major increase in capital accumulation implied by the PRAs would eventually depress the marginal product of capital and therefore the rate of return on financial assets. But even in the very long run and with the extreme assumption that all of the additional saving is added to the domestic U.S. business capital stock, the rate of return would only decline by about one percentage point. More realistic assumptions about the investment of the additional saving would imply an even smaller effect on the rate of return.

payroll (about 50 percent of GDP) in 2030 and 260 percent of payroll (or about 100 percent of GDP) in 2060. Not all of these assets would represent incremental saving (since those who contribute to personal retirement accounts might reduce other saving) and, of the incremental saving, not all would be invested in the U.S. business capital stock (some would go into owner-occupied housing, to investment overseas, or to replace foreign investment that would otherwise come to the United States). To the extent that increased domestic business investments does occur, the additional profits would lead to additional corporate taxes. Our calculations assume that a portion of those additional taxes would be transferred by the Treasury to the Social Security trust fund. To be very conservative, the transfer is based on the assumption that only one third of the personal retirement account assets becomes new business investment in the United States.<sup>9</sup>

#### The Cost of Transition to a Mixed System

Many economists and policy analysts acknowledge the long-run advantages of shifting from a pure pay-as-you-go system to a mixed system but believe that the transition involves unacceptable costs. This is often summarized by saying that the transition generation would have to pay “double” – to finance the Social Security benefits of current retirees and to save for its own retirement. Fortunately, the transition is much more manageable than these criticisms suggest. It is possible to slow the growth of the pay-as-you-go benefits (relative to the path projected in current law) in such a gradual way that the combination of the remaining pay-as-you-go benefits and the

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<sup>9</sup>The transfer from the Treasury to the Social Security trust fund would not be a transfer of existing revenue but only of new revenue created as a result of the personal retirement account system. An appropriate transfer can be estimated by assuming a pretax real return of 8.5 percent and an effective corporate tax rate of 29 percent, implying that the government should receive 2.5 percent of the incremental U.S. corporate capital. With the conservative assumption that only one-third of the personal retirement account balances are a net addition to corporate capital, the transfer to the trust fund would be 0.83 percent of the aggregate assets in the personal retirement accounts.

expected personal retirement account annuities financed with new saving of only 1.5 percent of taxable payroll (about 0.6 percent of GDP) would be equal to or greater than the benchmark benefits projected in current law.<sup>10</sup>

The Feldstein-Samwick analysis showed one way that this could be done. Although the assignment of 1.5 percentage points of payroll tax to the personal retirement accounts reduces the inflow to the trust fund, the slower growth of benefits reduces the outflow as well. The trust fund declines more rapidly at first than it would under current law but the pace of decline eventually slows and the trust fund begins to rise. In our analysis, the trust fund remains positive in every year and is increasing strongly after the transition is complete.

Although the shift of payroll tax funds to the personal retirement accounts temporarily increases the budget deficit, it does not reduce overall national saving because the decrease in the net tax revenue is exactly matched by the transfer of funds to the personal retirement accounts. The national income statistics would record equal decreases in government saving and increases in private saving with no net impact on national saving. Indeed, the plan as a whole is likely to increase national saving for several reasons. The larger budget deficit would bring pressure to control government spending. The additional out-of-pocket saving that individuals do to qualify for the matching transfer of payroll tax revenue would further add to national saving. Although individuals could in principle reduce other saving to offset part of their personal retirement account contributions, there would be little reason to do so since their personal retirement account saving is needed to balance the slower growth of the pay-as-you-go benefits.

There are of course many ways to slow the growth of the pay-as-you-go benefits to the

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<sup>10</sup>In Feldstein (1998) I described how “recognition bonds” of the type used in Chile could be used to manage the transition. I now believe that that is not necessary and would not be helpful.

amount that can be financed without raising the payroll tax or causing the trust fund to borrow. The Feldstein-Samwick plan keeps the combination of expected annuities and pay-as-you-go benefits in each year at least equal to the benchmark benefits scheduled in current law by applying the following transition formula to everyone not retired when the transition begins (although in practice there would probably be a phase-in period of as much as 10 years to avoid excessively small accounts): pay-as-you-go benefits are reduced by 0.3 percent per year during the first five years of the program, by 0.6 percent for the next five years, followed by 0.9 percent and 1.2 percent and eventually 1.5 percent per year up to a cumulative maximum reduction of 40 percent from the benchmark level of benefits. This achieves the long-term adjustment of pay-as-you-go benefits that is needed to avoid any increase in the 10.6 percent OASI tax rate. With this path of pay-as-you-go benefits, the combined benefits would be slightly greater than 100 percent of the benchmark for all those who reach normal retirement age during the next 35 years and would then begin to increase substantially. When today's 21 year-old retires, he would receive only 60 percent of his benchmark benefit from the pay-as-you-go portion but the combined amount would exceed the benchmark benefits by 20 percent. In short, a transition path can be designed so that there are no reductions in expected retirement incomes of future retirees and no macroeconomic budget dislocations.

Alternative transition paths can avoid any out-of-pocket individual contributions and still achieve the necessary increase in saving that permits the gradual substitution of personal retirement account annuities for pay-as-you-go benefits. This is even true of a transition in which the initial personal retirement account deposits are financed by government borrowing with no out-of-pocket personal saving. The initial deposit to personal retirement accounts financed by government borrowing would have no concurrent net effect on national saving because the

increased budget deficit would be offset by the deposit of those funds into the personal retirement accounts. But, over time, the availability of the personal retirement account annuities would permit reducing the pay-as-you-go benefits (relative to those projected in current law) without lowering total retirement income. This reduction in the pay-as-you-go benefits would mean that the annual rise in the budget deficit would be less than the amount transferred to the personal retirement accounts. This difference would be an increase in national saving that would grow over time.<sup>11</sup>

Before commenting on the three problems that concern the critics of investment-based plans - - administration costs, risk, and income distribution -- I turn now to discuss the fundamental economic gains from shifting from the current pure pay-as-you-go system to a mixed system. A reader who wants to skip the analysis of the economic advantages and go directly to the discussion of these three criticisms can do so without losing anything needed to understand the later part of the paper. For a more complete treatment of these issues, see the Feldstein and Liebman (2002a) chapter on Social Security in volume 4 of the Handbook of Public Economics (Auerbach and Feldstein, 2002).

#### Avoiding an Increase in Labor Market Distortions

Increasing the OASI payroll tax rate from 10.6 percent to 16.4 percent (and raising the other tax rates to maintain the currently projected revenue as the tax base shrinks in response to higher marginal tax rates) would cause a major rise in the deadweight loss of the tax system equal to about 40 percent of the incremental payroll tax revenue. Shifting to a mixed system that avoids

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<sup>11</sup>Feldstein and Liebman (2002a, section 7.1.3) uses an overlapping generation model to show how such a debt financed transition could raise saving and therefore the present value of consumption. The rise in saving does not happen in the first period but begins after that. The debt service on the initial borrowing cannot be financed by additional borrowing alone; the growth of the debt must be less than the growth of the economy.

the rise in the OASI payroll tax rate would eliminate that permanent rise in the deadweight loss. This section discusses the calculation of that extra avoidable deadweight loss.

Three adjustments must be made to calculate the relevant tax rates for this calculation. First, because the half of the payroll tax that is paid by the employer is excluded from the individual's taxable income, the effective rise in the marginal tax rate is 4.9 percent instead of the 5.8 percent implied by comparing the 10.6 and 16.4 percent tax rates. The other marginal tax rate increases that are induced by the need to offset the shrinking tax base increases this rise to 6.15 percent.<sup>12</sup>

A similar correction is also needed to assess the effective marginal tax rate without the increase. Of the 15.3 percent current total payroll tax, the employer's share is 7.65 percent. For someone who pays a 30 percent marginal income tax rate, this corresponds to a net payroll tax of 5.35 percent. Combining that with the 7.65 percent paid by the individual implies a base net payroll tax of 13 percent. The full marginal tax rate for such an individual is 43 percent.

One further adjustment is needed to calculate the current net marginal tax rate. The present actuarial value of the additional benefits that result from increased earnings must be subtracted from the 43 percent to obtain the net marginal federal-state rate. This value of additional benefits varies substantially from zero for some groups of workers (young workers and dependent spouses), to more than the incremental tax for older individuals with dependent spouses (Feldstein and Samwick, 1992). The Feldstein-Samwick (1992) calculations suggest a value of about 5 cents per extra dollar of taxable earnings, reducing the 43 percent marginal tax rate to 38 percent.

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<sup>12</sup>The full additional tax, as noted on page 6 above, is 1.3 percent. Since only 0.3 percent of this is a rise in the other payroll taxes that are affected by the employer exclusion, the net effect is an increase of 1.25 percent.

In contrast, the increase in the payroll tax rate needed to deal with the demographic change would not bring any additional benefits. The relevant marginal tax rate therefore rises from 38 percent to about 44 percent.

Since the deadweight loss of the tax system is approximately proportional to the square of the marginal tax rate, the increase in the marginal tax rate from 38 percent to 44 percent would raise the deadweight loss of the current combined personal income tax and payroll tax by about 35 percent. The actual magnitude of the additional deadweight loss depends on the relevant behavioral elasticity and is proportional to the size of the tax base.

The elasticity that determines the deadweight loss is the elasticity of taxable labor income with respect to the individual's net of tax share, that is, to one minus the marginal tax rate (Feldstein, 1999). The responsiveness of *taxable* labor income is much greater than the traditional elasticity of working hours with respect to the net wage. The relevant measure of labor supply that affects taxable labor income includes not only participation and average hours but also effort, occupational choice, risk taking, and so on. In addition, taxable labor income depends on how much of the potential income is taken in cash and how much in fringe benefits, nice working conditions, and other forms that are not taxable income. It is not possible to estimate these distortions separately, but since the prices of "leisure" (broadly defined) and of the tax-free forms of compensation are all equal to one minus the marginal tax rate, their sum (and therefore overall taxable income) is a "Hicksian composite good" that can be treated as a single good for the purpose of calculating the deadweight loss of distorting taxes. Recent research suggests that a reasonable estimate of the long-term compensated elasticity of taxable labor income with respect to the after-tax share (i.e., to one minus the marginal tax rate) is 0.5 (Feldstein, 1995a; Auten and Carrol, 1999; Gruber and Saez, 2002; Giertz, 2004).

Using the traditional approximation of the deadweight loss, the increase in the deadweight loss when the marginal tax rate rises from  $t_1$  to  $t_2$  is given by:

$$\text{change in deadweight loss} = 0.5 E (t_2^2 - t_1^2) B / (1 - t_1)$$

where  $E$  is the relevant elasticity,  $B$  is the tax base,  $t_1 = 0.38$  (the initial marginal tax rate) and  $t_2 = 0.44$  (the rate after the tax increase). With  $E = 0.5$ , the change in the deadweight loss is 2 percent of the tax base. Since the additional revenue to be raised is 5.1 percent of the tax base (the difference between the current 10.6 percent and the needed 15.7 percent), the additional deadweight loss is 40 percent of the revenue that needs to be raised.

Shifting to a mixed system with an investment-based component would make it possible to avoid the payroll tax increase and the associated deadweight loss while maintaining the expected level of pension benefits. The reduction in the deadweight loss due to avoiding the increased labor market distortion would be a true improvement in long-run economic efficiency. Although achieving this would require a temporary increase in saving, if individuals receive the same rate of return that they would get in an IRA or 401k, there would be little or no deadweight loss associated with the increase in saving. The only deadweight loss that would occur would be the result of requiring some individuals to save more than they would prefer to save even at the higher rate of return that the PRAs allow. Individuals who are constrained by dollar limits on IRA and 401(k) contributions would see the increased saving opportunity in the PRAs with a tax-favored rate of return as a positive benefit.

#### The Increase in Saving and in the Intergenerational Present Value of Consumption

Adding an investment-based component to Social Security would reduce the present value cost of maintaining the currently projected retirement benefits. More specifically, it would reduce the discounted present value of the pay-as-you-go taxes plus the personal retirement account

saving needed to finance the currently projected benefits. Equivalently, the adoption of the investment-based component in the Social Security system would raise the present value of private consumption discounted over all current and future generations. This increased present value does not imply a Pareto improvement that makes all generations better off, but it is a useful summary measure of the impact of adopting an investment-based program.

Although this increase in the present value of consumption under realistic assumptions is straightforward to prove, few aspects of the Social Security reform debate have created as much confusion as this basic proposition. The confusion arises because in a simple textbook case there is no present value gain. But with a more realistic description of the economy that takes into account the existence of capital income taxes, the present value gain becomes clear.

Before describing this present value calculation, consider the magnitude of the gain in steady state (i.e., after the transition) from substituting an investment-based component for the increase in the payroll tax that would otherwise be needed to finance future benefits. More specifically, consider the advantage to an employee who shifts his saving for retirement from a pay-as-you-go system with a 2 percent Samuelsonian real rate of return to an investment-based system with a real rate of return of 6 percent.<sup>13</sup> The individual starts working at age 25, retires at 65 and lives until 85. The implications of the two interest rates can be approximated by assuming that all of the “contributions” for retirement occur at age 45 (in the middle of the working life) and all of the retirement income is paid out at age 75 (in the middle of the retirement period). With an

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<sup>13</sup>The full marginal product of capital on the funds created by the personal retirement account would be about 9 percent. Assuming a return of 6 percent can be regarded as focusing on the after-tax return to the individual and ignoring the extra 3 percent that accrues to the nation in the form of taxes. An alternative interpretation is that the 6 percent return is the certainty equivalent return to the nation associated with the mean risky return of 9 percent; the calculations underlying this are discussed in my 1996 Ely Lecture (Feldstein, 1996) and in the Risk section below.

implicit rate of return of 2 percent, \$100 saved at age 45 grows to \$181 at age 75. If the individual could obtain a rate of return of 6 percent instead, the same \$181 at age 75 could be obtained by saving only \$32 at age 45. Applying this 32 percent ratio to the payroll tax rate, the 6 percent rise in the payroll tax rate required in the long run to maintain benefits with a pure pay-as-you-go system could be replaced by real savings of only 1.92 percent of payroll.

This focus on the long run ignores the need to finance benefits during the transition years for those who have been paying into the pay-as-you-go system. I have already discussed the feasibility of such a transition in an earlier section. Now I want to focus on the question of whether shifting from a pay-as-you-go system to an investment-based system increases the present value of consumption over all generations. Equivalently, does the introduction of a pay-as-you-go system that replaces private saving reduce the present value of consumption over all generations?

Consider first the textbook case in which there are no taxes on capital income. Following Samuelson (1958), each individual lives for two periods, working in the first and being retired in the second. Consider the introduction of a pay-as-you-go Social Security system with the initial tax collection paid to the concurrent generation of retirees. Let  $r$  be the marginal product of capital in the economy and let  $g$  be the implicit rate of return on the pay-as-you-go accounts (the rate of growth of the payroll tax base). If the first generation of taxpayers pays a payroll tax of  $T$  in the pay-as-you-go program, it receives  $(1 + g) T$  in retirement. If it had instead saved and invested the amount  $T$  in economic assets, it would have received  $(1 + r) T$  in retirement. The loss of return to this first generation of taxpayers is therefore  $(r - g) T$ . The present value of this loss at the first

period of this generation's life is  $(r - g)T/(1 + r)$ .<sup>14</sup>

In this simple model, the discounted present value of these losses over all generations of taxpayers is just equal to the initial windfall benefit,  $T$ , received by those who are retired when the pay-as-you-go program begins.<sup>15</sup> In this textbook case the introduction of the pay-as-you-go system just transfers income from future generations to the initial one. This result, which has been derived many times before (Feldstein, 1995b; Murphy and Welch, 1998; Geanakoplos et al 1998), assumes that there are no capital income taxes and that the appropriate discount rate for aggregating consumption over all future generations is the marginal product of capital. Neither of these assumptions is defensible.

With more realistic assumptions, the gain to the initial generation from creating a pay-as-you-go system would be much less than the present value of the losses to all future generations. One reason for this difference is that each taxpaying individual should calculate the present value

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<sup>14</sup>This shows that there would be no loss if the economy were at the "golden rule" point where the rate of growth is equal to the marginal product of capital. The United States is very far from the golden rule point with the annual growth rate of 3 percent and the annual marginal product of capital of about 9 percent.

<sup>15</sup>To see this, note first that, with a constant proportional tax rate on wage income, the amount of tax paid grows over time from one generation to the next with the increasing size of the tax base, reflecting the increase in the number of workers and in their average wage. The tax for generation  $t$  is therefore  $(1 + g)^t T$ . The loss to that generation is  $(1 + g)^t T (r - g)/(1+r)$ . The present value of the losses over all the taxpaying generations, discounting at the marginal product of capital, is therefore

$$\sum_{t=0}^{\infty} (1+r)^{-t} (1+g)^t T [(r - g) / (1+r)] =$$

$$T [(r - g) / (1+r)] \sum_{t=0}^{\infty} (1+r)^{-t} (1+g)^t$$

Since the infinite sum  $\sum_{t=0}^{\infty} (1+r)^{-t} (1+g)^t$  equals  $(1+r)/(r-g)$ , the present value of the losses over all taxpaying generations is  $T [(r - g) / (1+r)] \{ (1+r)/(r - g) \} = T$ .

of his lost retirement income by using the real net of tax rate of return ( $r_n$ ), a number substantially smaller than the marginal product of capital assumed in the simpler model.<sup>15</sup> A second reason is that (in the absence of optimal lump sum intergenerational redistributions) the discount rate that is appropriate for aggregating the consumption of different generations must reflect a social welfare function judgement rather than being the marginal product of capital. More specifically, aggregating the consumption of different generations should reflect the rate of decline of the marginal utility of consumption. For any realistic values of the elasticity of the marginal utility of consumption and the rate of growth of consumption, this intergenerational consumption discount rate ( $d$ ) would be substantially less than the marginal product of capital.<sup>16</sup> Using these values of ( $r_n$ ) and  $d$  to discount future losses implies that the present value of loss to all generations of taxpayers exceeds the windfall to the initial generation.<sup>17</sup>

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<sup>15</sup>A pretax marginal product of capital of  $r = 0.085$  and corporate and personal tax rates of 30 percent each imply  $r_n = 0.042$ .

<sup>16</sup> The value of  $d$  measures the time discounting implied by the social welfare function, i.e.,  $1 + d$  is the marginal rate of substitution between consumption in adjacent generations. If per capita consumption grows at 2 percent a year and the social welfare function has an elasticity of the marginal utility of consumption of 2, the marginal utility declines at 4 percent per year.

<sup>17</sup>The loss to generation  $t$  is  $(1 + g)^t T (r - g) / (1 + r_n)$  and the present value of the losses for all taxpaying generations is

$$\sum_{t=0}^{\infty} (1 + d)^{-t} (1 + g)^t T (r - g) / (1 + r_n) = \{ (r - g) / (d - g) \} [ (1 + d) / (1 + r_n) ] T$$

For realistic values (with  $d$  less than or equal to  $r_n$  and  $r_n$  less than  $r$ ), this expression is substantially larger than  $T$ , implying that the present value loss to all generations of taxpayers exceeds the windfall to the initial generation. Note that this assumes that generation  $t$  would otherwise have received the full benefit of its saving,  $r(1+g)^t T$ , even though the net investment income would be just  $r_n(1+g)^t T$ . This implies that the capital income tax revenue would be spent on that generation. A more general distribution of the tax revenue between the two generations would complicate the analysis without changing the basic conclusion.)

Some illustrative values will indicate the potential magnitude of this difference. Since this is a model in which individuals live only two periods, the various rates of return should be thought of as returns for roughly 30 years. Thus if the annual marginal product of capital is 9 percent,  $1 + r = (1.09)^{30} = 13.3$ , implying  $r = 12.3$ . Similarly, if the annual rate of growth of the

In short, although the political interest in the shift to mixed systems that is seen around the world reflects the budget implications of the aging population, the positive economic consequences of such a shift are to raise the present value of consumption and to reduce labor market distortions.

### Administrative Costs

Critics of investment-based plans sometimes argue that high administrative costs will absorb much of the difference in rates of return between pay-as-you-go and investment-based plans. Although some countries have experienced high administrative costs, the favorable experience in other countries and of our own mutual funds makes this claim unconvincing.

Sweden recently created a mixed system with contributions equal to 2 percent of payroll. Participants are offered a very large number of investment alternatives, including actively managed equity funds that invest abroad. The average administrative cost of these plans is only about 0.8 percent of assets. As assets grow and the need for marketing expenses declines, these administrative costs should decline as a percent of assets.

In the United States, TIAA-CREF offers plans that allow individuals to accumulate stock-bond mutual funds in a pension account and to convert the accumulated balance at retirement to a variable annuity. Despite selling costs and rules that allow frequent portfolio shifts, TIAA-CREF is able to offer this product with a fee of less than 0.4 percent of assets. The President's Commission to Strengthen Social Security uses estimates provided by the Social Security Office of the Actuary that the administrative cost of an investment-based system with individual accounts

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tax base is 3 percent,  $g = (1.03)^{30} - 1 = 1.43$ . With the annual net return equal to 4 percent,  $r_n = (1.04)^{30} - 1 = 2.24$ . With the intergenerational discount rate based on a 4 percent per year rate of decline of the marginal utility of consumption,  $d = (1.04)^{30} - 1 = 2.24$ . Substituting these into the expression in the text implies a present value loss to all taxpaying generations of 13.4 T, substantially greater than the initial windfall gain of T.

could be kept to between 0.3 percent of assets and 1.0 percent of assets, depending on the particular administrative arrangements.

Since the assets that would be in the investment-based plans have had an historic real rate of return of 6.9 percent while the Social Security actuaries project that the implicit real rate of return on Social Security contributions for someone entering work now would realistically be less than two percent, the administrative costs cannot absorb a major part of the yield difference.

The key determinants of the administrative costs of any mutual fund (and therefore of a personal retirement account system) are in marketing, in the collection of the funds, in the frequency with which investments can be changed from one investment manager to another, and in the extent to which individuals can talk to staff at the fund manager (Shoven, 2000; Goldberg and Graetz, 2000). Having the Social Security Administration collect funds from employers and transfer them to money managers would achieve substantial cost savings as would limiting the frequency with which funds can be changed from one fund manager to another.

The notoriously high administrative costs in some Latin American countries reflect an incentive structure that causes individuals to disregard costs when choosing among plans. The Mexican plan provides that someone who entered in the early years of the plan has the option at retirement age to surrender his personal retirement account assets and receive the benefits that he would have received under the old pay-as-you-go system. Since someone who was 50 years old or older when the new system began could not possibly accumulate more in his investment account than he would be entitled to under the old rules, the cost and return in the personal accounts was irrelevant. Any promotional gift or other incentive to choose a particular plan or to change plans could therefore draw individuals to a high cost plan. There is no reason, however, to assume that such a problem would keep costs high in the United States.

## Risk

Pay-as-you-go benefits and investment-based benefits are both inherently uncertain. The possibility of substantial reductions in future U.S. Social Security benefits or increases in the normal retirement age shows that pay-as-you-go benefits are uncertain in a world of unpredictable demographics and unreliable politics. Mc Hale (2001) and Feldstein and Siebert (2002) discuss a number of countries that reduced pay-as-you-go benefits. More recently, Germany and Japan have joined the list of countries that have cut benefits or announced future benefit reductions.

Investment-based accounts are of course subject to market risk, but these market risks can be quantified and can be reduced by investment strategies. Moreover, since the nature of the pay-as-you-go uncertainty is fundamentally different from the uncertainty in an investment-based system, a mixed system that combines both types of benefits may provide greater protection than a pure pay-as-you-go system or a pure investment-based system.

How should the riskiness of investment assets be taken into account in evaluating their use in financing future pension benefits? It is wrong to argue, as some have, that the returns on stocks and bonds in a personal retirement account should be evaluated as if they were risk-free government bonds since (their argument goes) any higher expected return is just a compensation for risk. That argument assumes that individuals have already optimized the degree of risk in their portfolios and are therefore indifferent at the margin between the risky and riskless assets. If so, the “certainty equivalent” return on the risky stock-bond portfolio is the same as the return on the riskless asset. I believe that analysis is unconvincing for two reasons. (Feldstein, 1996).

First, about half of American households own no equities. I believe that is not because they are too risk averse, but rather because their total assets are so small in value that it would not be worth the time and effort to learn to invest in stocks or mutual funds. For such households, the

“certainty equivalent” return on a small investment is its expected value and the certainty equivalent of subsequent investments exceeds the risk-free rate of return.

Second, a substantial fraction of the return on risky real investments in corporate capital is taken by the federal, state and local governments in taxes. The government then spreads the risk of these returns over all taxpayers and recipients of government services, a group that includes many with little or no financial wealth and therefore who can be risk neutral for moderate amounts of “their share” in this return. In Feldstein (1996) I discussed why the certainty equivalent of the real pretax risky return on additions to the corporate capital stock could be about 6 percent.

One crude but useful way to assess the risk of introducing an investment-based component in the U.S. Social Security system is to ask what would happen if future rates of return on stocks and bonds were very much less than they were in the past. Feldstein and Samwick (2002, Table 6) calculated the combined benefits that would result with the plan described above (funded by 1.5 percent of payroll from the payroll tax and an equal amount of private saving) if the rate of return in the personal retirement accounts was consistently only half of the historic 6.9 percent average. Even in this extreme case, the combined benefits would be at least 95 percent of the benchmark benefit for those who reach normal retirement age in the first 20 years of the mixed program, an outcome that reflects the fact that the mixed program is still largely pay-as-you-go during that period. In the long run, after 50 years, the combined benefits would be at least 90 percent of the benchmark, reflecting the relatively high expected investment-based benefits even with the low return. The worst projected performance occurs in the 35<sup>th</sup> year of the program when the combined benefits would replace 84 percent of the benchmark benefits.

A more sophisticated way to assess the riskiness of the mixed program is to look at the full

probability distribution of potential outcomes as measured by the ratio of the combined benefits to the benchmark of currently “scheduled” benefits. Feldstein and Rangelova (2001) provide the information needed for this calculation.<sup>18</sup> We did 10,000 simulations to obtain the fully phased-in distribution of pure personal retirement account benefits based on a very conservative real mean return of 5.5 percent and a standard deviation of 12.5 percent, the historic standard deviation of a continually rebalanced 60:40 equity-debt portfolio.<sup>19</sup> If these pure investment-based results are combined with a pure pay-as-you-go benefit equal to 60 percent of the projected “benchmark” benefit, we find that at the lowest 10<sup>th</sup> percentile, the combined benefit would equal 88 percent of the benchmark benefit. Even at the lowest one percent level, the combined benefit would still equal 70 percent of the benchmark benefit.

A government guarantee could reduce this risk further. Feldstein, Rangelova and Samwick (2000) explored the cost of a government guarantee in the extreme case of a pure investment-based plan ( with no pay-as-you-go component). The analysis, which assumed that the individuals invest in the standard 60:40 stock-bond portfolio, found that even with no pay-as-you-go component, the potential cost to taxpayers of guaranteeing an annuity at least equal to the benchmark benefits would be very small (a 70 percent chance that no guarantee payment would be needed in a typical year and only a one percent chance that the combination of the personal

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<sup>18</sup>Our calculation was of a pure investment-based plan but the distribution of a mixed plan can be estimated by assuming that the pay-as-you-go benefit is paid with certainty. The reliability of such future pay-as-you-go benefits is enhanced by eliminating the need for any future tax increase.

<sup>19</sup>The simulation procedure recognizes that the historic mean is only a sample estimate by using a two-level simulation procedure in which a mean return is drawn for each “individual” from a distribution with the 5.5 percent mean and a standard deviation equal to the standard error of that estimate. A lifetime of individual returns (i.e., from age 21 to 100) are then drawn with that mean and a standard deviation of 12.5 percent. The process is repeated 10,000 times to get the distribution.

retirement account saving and the government guarantee payment would exceed 14 percent of payroll, less than the tax rate needed in the pure pay-as-you-go system). In practice, the guarantee would not require individuals to invest in this standard portfolio as long as the guarantee was paid only if the “standard 60:40 portfolio” failed to produce benefits equal to the benchmark. This would avoid the moral hazard problems of individuals seeking risky investments because of the guarantee and not seeking low cost providers.

More recently, I have been exploring how the private market could provide guarantees that reduced the risk of the investment-based plans. One possibility is to include enough long-term government inflation indexed bonds in the portfolio to guarantee no loss of principal. For example, a personal retirement account manager (an insurance firm, bank or mutual fund) could guarantee a 30 year old that the funds that he saved that year would at least retain their real value to age 67 by investing about 60 percent of the funds in such bonds and the rest in equities. The expected performance of that investment (based on past experience) would be a real rate of return of 4.7 percent, substantially higher than the implicit yield on Social Security. A simulation of making that type of investment at every age, as part of a mixed Social Security plan, shows a high probability that the resulting annuities would be substantially greater than the benchmark benefits and that the probability that the annuity would be less than 90 percent of the benchmark benefit is less than one percent. The personal retirement account managers could also offer other risk profiles by using no-net-cost derivatives. (Feldstein, 2005b)

In short, the expected annuities produced by a mixed system would be substantially larger than the benchmark pay-as-you-go benefits while requiring a much smaller increase in contributions (taxes plus saving) . The risk that this combined annuity would be substantially less than the benchmark benefits is very small.

## Income Distribution Effects

Some opponents of a mixed Social Security system are concerned that investment-based accounts would weaken what they perceive as the redistributive character of the current Social Security program. In fact, although the formula relating Social Security benefits to past earnings appears to provide substantial redistribution from higher income earners to those with below average earnings, several studies have now documented that very little net redistribution occurs (Gustman and Steinmeier, 2001; Liebman, 2002; Coronado, Fullerton and Glass, 2000). This is because individuals with high lifetime incomes have lower mortality rates and therefore more retirement benefit years, start working and paying tax at a later age, and are more likely to take advantage of spouse benefits. Thus, an investment-based component in which all employees contribute the same proportion of their earnings and experience the same rate of return would not be very different from the current system in its distributional effect.

Despite nearly \$500 billion of Social Security benefits in 2004 and the additional outlays for the means tested Supplementary Security Income program, about 10 percent of those over age 65 remain in poverty. Groups with high poverty rates include women who are widowed or divorced, especially those who are widowed or divorced before age 50. Feldstein and Liebman (2002b) show how such women would benefit by inheriting the personal retirement account of their deceased husband or by splitting their two accounts at the time of divorce.

A mixed system could be designed to provide greater redistribution. For example, the matching rate used to induce participation could be higher for low income earners. The pay-as-you-go formula and the rate at which benefits are adjusted over time could also be modified to increase progressivity.

The redistributive effect of the Social Security program depends of course on the tax as

well as on the benefits. More than 50 percent of households now pay more in payroll tax than income tax. It is difficult to think of any plausible tax policy that would benefit this group more than avoiding the sharp rise in their payroll taxes.

#### Ad Hoc Changes without Structural Reform

While everyone now recognizes that some change is necessary to maintain the solvency of Social Security, some economists and policy analysts reject any structural change of the program and would prefer to achieve solvency by a combination of tax increases and benefit reductions. These proposed changes generally emphasize tax increases aimed at higher income employees.<sup>20</sup>

One simple proposal that was popular a few years ago called for a two percentage point increase in the payroll tax to eliminate the “75 year deficit” of the program, that is, raising the payroll tax by two percentage points would increase the trust fund balance and permit it to earn enough interest on its investment in government bonds to be able to continue paying benefits for 75 years. We hear less about such a plan today because it is now generally recognized that the 75-year deficit would only disappear for a single year. After one year, a 75-year deficit would return because of the large deficit that initially existed in the 76<sup>th</sup> year. More importantly, at year 75 it would be necessary to raise the tax rate to more than 16 percent or to cut benefits sharply. The two-percent plan would increase the deadweight loss due to higher marginal tax rates from year

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<sup>20</sup>Diamond and Orzag (2004) propose tax increases about three times as large as the net benefit reductions. These proposed tax increases fall primarily on above average earners, achieved by raising the maximum taxable earnings and imposing a special tax on earnings above the maximum. The income-related reductions in benefits also increase the deadweight loss of the program.

Another piece of the Diamond-Orzag proposal is to levy Social Security taxes on state and local workers. Although they discuss the “fairness” of imposing this additional burden on those workers, the actual incidence would presumably be on the state and local governments and their taxpayers. Since the state and local employees are free to choose whether to work in the public or private sector, the current wage difference should already reflect the advantage of not paying a payroll tax in the state and local sector.

one but would not solve the long-run problem. Even the medium term solution would only be economically meaningful if the extra 2 percent tax revenue actually led to reductions in total budget deficits or increases in saving so that the capital stock grew. Past experience with Social Security surpluses does not give any reason to believe that this would occur. Fortunately, the two percent tax plan is no longer being actively proposed.

Another very widespread idea is to increase the ceiling on earnings subject to the payroll tax (e.g., Diamond and Orzag, 2004). Such a change would raise the marginal tax rate for the affected individuals from 33 percent now to about 43 percent, causing the deadweight loss of the tax system to rise by 70 percent for these individuals.<sup>21</sup> Although an increase in the maximum income subject to the Social Security tax would raise additional payroll tax revenue, almost all of this extra revenue would be offset by lower personal income tax revenue. As I discussed earlier, a higher marginal tax rate would reduce taxable income by lowering labor supply and changing the form of compensation to untaxed fringe benefits. This would not only shrink the base of the payroll tax but would also reduce the income subject to other taxes. With the help of my NBER colleague Dan Feenberg, I used the NBER Taxsim model (a sample of about 100,000 anonymous individual tax returns provided by the Treasury Department) to evaluate the effect of raising the \$87,900 ceiling to \$120,000. With no behavioral response, the payroll tax would rise by \$19 billion at the 2004 level of incomes. But changes in behavior (assuming a conservative estimate

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<sup>21</sup>The deadweight loss is proportional to the square of the marginal tax rate. An individual who earns \$100,000 now faces a marginal tax rate of about 33 percent (a federal rate of 25 percent, a state rate of 5 percent, the medicare payroll tax rate of 3 percent ). Imposing the 12.4 percent payroll tax on the currently excluded income (the 2.9 percent Medicare tax is currently levied on all earnings) would raise the marginal tax rate for these individuals by 10.5 percent because the employer tax of 6.2 percent would reduce the federal and state income tax by 30 percent of that amount. Increasing the marginal rate from 33 percent to about 43 percent would cause the deadweight loss to rise by 70 percent.

of 0.4 for the compensated elasticity of taxable labor income with respect to the net of tax rate and an income effect of 0.15) would shrink the additional payroll tax revenue to \$16 billion and cause the federal and state personal income tax revenue and the Medicare payroll revenue to fall by about \$11 billion. This means that more than two-thirds of the \$16 billion increase in Social Security revenue comes at the expense of reduced funds for general revenue and for the Medicare trust fund. The combination of a sharp increase in the deadweight loss and little additional revenue makes this a very unattractive option.

### A Central Investment Account

A quite different proposal would create a mixed system in which the investments in real capital through stocks and bonds would be in the Social Security trust fund. This would be fundamentally different from the current pay-as-you-go system in which the government uses the trust fund to finance other forms of government spending. Aaron and Reischauer (1998) developed such a proposal in detail. In a formal sense, this could have the same economic advantages on national saving and labor market deadweight loss as the personal retirement accounts.

But a central investment account in Social Security would raise a very serious risk of government interference in the economy. Recall that by about 2030 the 3 percent contribution plan described above (with 1.5 percent from the payroll tax revenue and 1.5 percent from individual saving) would create assets in personal retirement accounts equal to 50 percent of GDP or nearly \$6 trillion at the income level of 2004. That much asset ownership by the Social Security trust fund would bring substantial control over the economy and over individual firms. There would undoubtedly be political pressure not to invest in firms that are engaged in disfavored activities (outsourcing, overseas investment, producing products like cigarettes) and pressure to

make “social investments” ( infrastructure, low income housing, pollution control). The government fund managers would also face difficult decisions about how to vote shares or deal with bonds, especially during mergers or bankruptcies that would affect employment in local areas.

It is hard to imagine any set of safeguards that would protect the fund managers from the political process when the amounts are as large as half of GDP and growing to more than 100 percent of GDP. If the future of Social Security is to include an investment-based component, it will almost certainly have to take the form of personal retirement accounts.

### Conclusion

Although the financial outlook for Social Security is correctly regarded as a major fiscal problem, it is also a great opportunity to make changes that would be desirable even if the program did not face financial strain from demographic change.

The shift from the pure pay-as-you-go system to a mixed system with a significant role for investment-based personal retirement accounts can reduce the distortions in the labor market and increase the present value of expected future consumption. The transition to such a mixed system can be done gradually in a way that does not require large deficits, a tax increase, or a decrease in expected retirement incomes. Pay-as-you-go benefits would grow more slowly than scheduled in current law but the expected retirement income of all cohorts would equal or exceed those scheduled benefits because of the growing size of the expected personal retirement account annuities.

If managed properly, the administrative costs would be small. The risk of a mixed system could be limited by the continued role of the pay-as-you-go benefits, by rules governing personal retirement accounts investments, and by private market guarantees for individuals willing to give

up some expected yield for greater certainty of future benefits. Finally, a mixed system need not change the overall distributional character of Social Security but could offer greater benefits to retiree groups that remain poor under our current Social Security rules.

The rapid aging of the population implies that it will become increasingly difficult to start a successful transition in future years. A failure to act in the next few years may make a large tax increase inevitable.

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