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SOCIAL SECURITY PRIVATIZATION: WHAT ARE THE ISSUES?

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Social Security privatization is now receiving much attention in policy circles. Proposed privatization plans range from modest changes in the mix of assets held by the Social Security trust fund to the phased-in replacement of all Social Security benefits and taxes with mandatory Individual Retirement Accounts (IRAs).

Much of the current interest in privatization stems from the realization that any reform of Social Security that is financially feasible and that maintains the program's current structure would not be a good deal for current and future workers. These workers would receive benefits that represent lower than market rates of return on taxes paid. On the surface, therefore, it would seem that Social Security can be made more valuable by somehow tapping higher market rates of return. This simple reasoning suggests that privatization offers the possibility of a "free lunch" where nearly everyone is made better off.

A major objective of the paper is to demonstrate that the free lunch arguments for privatization are false. My purpose, however, is not to argue against (or for) privatization. My purpose is to help redirect the privatization debate toward what I regard as the pertinent issues. These issues concern possible political impediments to prefunding retirement incomes in government accounts--which would argue that prefunding can only take place in private accounts--and on the implications of privatization for how capital income risk is shared by individuals.

The paper begins by analyzing the current Social Security policy dilemma in the context of a simple model in which people live for two periods. This model helps elucidate an important truth: Social Security has already accumulated an implicit debt that cannot be fully revoked.

Hence, any Social Security reform that is financially sound in the long run effectively levies a net tax on current and future workers to service that debt. This accounts for the below-market rates of return that Social Security can promise to current and future workers.

I then demonstrate that substituting mandatory IRAs for traditional Social Security benefits and taxes would not relieve Social Security's implicit debt burden. This is done by showing that retirement systems based either on mandatory IRAs or on traditional publicly administered defined benefits can be designed so as to have similar implications for national saving and for the adequacy of overall retirement incomes.

The paper then turns to two issues that truly distinguish retirement systems that include mandatory IRAs from those that do not: the distribution of capital income risk, and the possibility that prefunding of retirement consumption can occur in private accounts but not in public accounts. I show that introducing mandatory IRAs would enable individuals who are currently liquidity-constrained to take on a larger share of capital income risk. With regard to prefunding, I argue on both efficiency and equity grounds that substantial prefunding is desirable, and that there is a very real possibility that prefunding can only occur in private accounts. I also point out that mandatory IRAs would most effectively prefund retirement consumption if investments were limited to one centrally managed investment fund so as to minimize administrative costs.

Finally, the paper considers arguments for investing all or part of the Social Security trust fund in equities. Again, the free lunch argument is rejected: I show that trust fund equity investments can increase the generosity of Social Security only to the extent that they reduce the

returns earned on the private sector's portfolio. Also analyzed is the possibility that trust fund equity investments would lead to a more efficient allocation of risk bearing. While this outcome cannot be ruled out, I conclude that undesirable outcomes are more likely.

WHY SOCIAL SECURITY IS NOT A GOOD DEAL FOR CURRENT AND FUTURE WORKERS

The basic nature of the current Social Security system can be understood in the context of a simple model where each individual is certain to live two periods, a working period and a retirement period. Each young person of generation g (young at time g) pays social security taxes of $SSTAX_g = \tau_g W_g$, where τ_g is the payroll tax rate and W_g is wage income. Letting η_g be the implicit rate of return received on social security taxes for generation g, social security benefits received by each member of generation g when retired at time g+1 are $SSBEN_g = \tau_g W_g (1+\eta_g)$.

As shown in table 1, this social security system can be interpreted in terms of mandatory implicit government bond purchases and a "pure tax" that can be positive or negative. Letting the real return on government bonds be denoted RB, each dollar of bonds purchased by workers yields 1+RB dollars at retirement. Hence, generation g's promised social security benefits could be secured with an implicit bond purchase of $BI_g = SSBEN_g/(1+RB) \equiv \tau_g W_g (1+\eta_g)/(1+RB)$. The pure tax is the difference between total social security taxes and the implicit bond purchase, or

$$(1) \quad PURETAX_g = SSTAX_g - SSBEN_g/(1+RB) = \tau_g W_g (RB - \eta_g) / (1+RB).$$

To verify that this interpretation of Social Security implies the correct cash flows, note that the sum of the implicit bond purchase and the pure tax adds up to total taxes; and that the proceeds

on the implicit bond, $(1+RB)BI_g = (1+\eta_g)\tau_g W_g$, equals the social security benefit amount, $SSBEN_g$. For ease of notation, and without loss of generality, I assume that the real government bond rate does not vary over time.

Social security's pure tax rate on wages, $\tau_g (RB-\eta_g)/(1+RB)$, can be positive or negative. If the implicit return earned on social security taxes is less than the return on government bonds, then social security taxes work effort. Otherwise, social security subsidizes work effort. Because individuals earn a fair return on forced implicit bond purchases, only the pure tax portion of total social security taxes should be regarded as true taxes.

In some contexts, it is useful to refer to social security's pure taxes as wealth transfers. Negative pure taxes are positive wealth transfers, and positive pure taxes are negative wealth transfers. Also, social security taxes that are not pure taxes will be referred to as "contributory taxes." These taxes purchase implicit bonds, and are a fair "contribution" made in exchange for social security benefits.

Feasible Wealth Transfers

A social security system is viable if it does not cause the stock of government debt to become so large as to make repayment impossible. This condition puts limits on the set of feasible wealth transfers (pure taxes) that a viable social security system can convey. To determine these limits, it is necessary to determine the time path of government debt as a function of social security's pure taxes.

To allow for the possibility of both a funded and an unfunded social security system, I suppose that the social security system begins with a tax levy at time 0 that might be zero, and

benefits commencing at time 1. (Taxes are zero at time 0 if the system is completely unfunded.) In this case, government debt at the beginning of time t attributable to the social security system is

$$D_t = \sum_{g=0}^{t-1} (N_{g-1} SSBEN_{g-1} - N_g SSTAX_g)(1+RB)^{t-g}, \ (t = 1,2,\ldots),$$

where N_g is the number of generation g members. (Note that $SSBEN_g$ are benefits paid to generation g at time g+1, (g=0,1,...).) This is conveniently rewritten as:

$$D_t = (1+RB)^t [\sum_{g=0}^{t-1} N_g \{SSBEN_g / (1+RB) - SSTAX_g\}(1+RB)^{-g} + N_{-1} SSBEN_{-1} - N_{t-1} SSBEN_{t-1}(1+RB)^{-t}], \ (t = 1,2,\ldots).$$

Noting that $SSBEN_{-1} = 0$ and $-\{SSBEN_g/(1+RB) - SSTAX_g\}$ is the pure tax that the social security system assesses each member of generation g (see (1)), government debt attributable to the retirement system at time t can be written:

$$(2) \qquad D_t = -(1+RB)^t \sum_{g=0}^{t-1} N_g PURETAX_g (1+RB)^{-g} - N_{t-1} SSBEN_{t-1}, \ (t = 1,2,\ldots.).$$

If government debt is repayable at some time t, then it must also be repayable at all previous times. Hence, a necessary and sufficient condition for the retirement system to be viable is that debt not be too large relative to GDP at an arbitrarily distant future date. Assuming that the growth rate of real GDP averages less than RB, the requirement that the debt-to-GDP ratio at an arbitrarily distant future date be bounded from above requires that:

$$(3) \qquad \sum_{g=0}^{\infty} N_g PURETAX_g (1+RB)^{-g} \geq 0.$$

That is, the present value of pure taxes assessed on all generations must be no less than zero. Stated in terms of wealth transfers rather than pure taxes, the present value of wealth transfers can be no greater than zero. Hence, any gain that a viable social security system conveys to one generation must be at the expense of other generations.

Funding Possibilities

A social security system is entirely prefunded only if the system's viability does not require that any pure taxes be levied on future generations. This can be true at all times only if there are no intergenerational wealth transfers (pure taxes), in which case the social security system reduces to forced implicit government bond purchases that are backed up with accumulations of government wealth. As seen from (2), if pure taxes are always zero, social security's contribution to explicit government debt at each point in time is negative (a positive trust fund balance) and equal to promised benefits.

Typically, however, social security systems pay much higher benefits to early generations of retirees than would be warranted by market rates of return and taxes paid. In this case, pure taxes are negative for early generations and, for the viability condition (3) to hold, it must be true that pure taxes are positive for at least one later generation. The social security system would effectively transfer wealth to early generations from later generations, and, at least initially, would not be entirely prefunded.

Of course, an unfunded or partially unfunded social security system can become completely prefunded. For example, social security could transfer wealth from generation 1 to generation 0, and levy no pure taxes on later generations. In this case, the system would be entirely funded after time 1, but not at earlier dates.

A Familiar Case

The conclusion that the present value of Social Security's wealth transfers cannot exceed zero might seem overly pessimistic. It is well known that a purely pay-as-you-go social security system with constant tax rate pays each generation a real rate of return on social security taxes equal to the growth rate of aggregate real wages (Samuelson, 1958). In this case, it might seem that the wealth transfers social security can convey are larger the larger is the growth rate of aggregate real wages, and that the zero present value condition for wealth transfers is therefore invalid.

However, close scrutiny of the simple pay-as-you-go model reveals that the present value of pure taxes is indeed zero provided the real return on government bonds exceeds the growth rate of aggregate real wages.[1] This model assumes that the social security tax rate is constant at τ, that all social security taxes are paid immediately to the old, and that the growth rate of

1. If the growth rate of aggregate real wages always exceeds the real government borrowing rate, then the present value condition on pure taxes (3) does not hold. In this case, it is possible that the economy is dynamically inefficient and a collective choice to decumulate capital by issuing public debt or introducing an unfunded social security system would make all generations better off. Samuelson (1958) shows that the economy is dynamically inefficient if the real return to capital is certain and the time-averaged growth rate of aggregate real wages exceeds the time-averaged real return on capital (also the real return on government bonds). The reality, however, is that the real return to capital is much higher on average than the growth rate of aggregative real wages. The more realistic case of an uncertain real return to capital is investigated by Abel et. al. (1989); they derive sufficient conditions for dynamic efficiency, and argue that these conditions are satisfied in the United States and other major OECD economies.

aggregate real wages is constant at ρ. Assuming the social security system starts at time 1, generation 0 receives benefits of $\tau N_1 W_1$ and pays no taxes. Its pure tax is negative, and equal to $N_0 PURETAX_0 = -\tau N_1 W_1/(1+RB)$. All later generations earn an implicit return ρ on social security taxes; hence, from (1), generation g , (g=1,2,.....), pays pure taxes that are positive and equal to $\tau N_g W_g (RB-\rho)/(1+RB)$. Simple algebra verifies that the present value of these positive pure taxes is precisely equal to the transfer received by generation 0 for all values of ρ less than RB.

The intuition for this result is straightforward. Generation 0 creates an implicit public debt $\tau N_1 W_1/(1+RB)$ that future generations must service by paying pure wage taxes at rate $\tau(RB-\rho)/(1+RB)$. The faster wages grow, the smaller is the pure tax rate. However, because the tax base is larger the faster wages grow, the absolute burden that generation 0 imposes on future generations is independent of wage growth.

Social Security's Implicit Debt Burden

As in this simple pay-as-you-go model, the current Social Security system has accumulated an implicit debt that must be serviced by current and future workers. This has occurred for two reasons. First, as in the simple model, benefits were paid to early generations who paid little tax. And, second, there have been several legislated increases in Social Security benefits and taxes, where again higher benefits were paid to individuals who paid higher taxes for relatively few years.

Figure 1 gives estimates made by Leimer (1994) of wealth transfers the current-law Social Security program has conveyed or will convey to cohorts born between 1876 and 2050.

The reported wealth transfers are adjusted for the time value of money using estimates of actual government borrowing rates, and are measured in 1989 dollars. For example, the 1900 cohort is estimated to have received transfers worth $136 billion in 1989; this means that if this cohort's transfers were financed with government debt that was continuously rolled over until 1989, then the debt would have accumulated to a total of $136 billion at that date.

All cohorts born between 1876 and 1937 are estimated to receive positive transfers. These transfers total $5.5 trillion 1989 dollars. Only a very small share of these wealth transfers could possibly be revoked, as the recipients are now either dead or age 62 or older. It follows that generations born after 1937 must pay pure taxes (suffer negative wealth transfers) that service all, or nearly all, of the $5.5 trillion (1989 dollars) implicit debt that was accumulated by the earlier birth cohorts. If the Social Security system is to be self-financing, these pure taxes take the form of Social Security benefits that have a lower present value than Social Security taxes paid.

Figure 1 shows that current law levies substantial pure taxes on cohorts born after 1937. Nevertheless, pure taxes are not large enough to fully service Social Security's implicit debt. The sum of pure taxes paid by cohorts born between 1938 and 2050 is estimated at $1.7 trillion 1989 dollars, only 44 percent as large as the implicit debt accumulated by earlier cohorts. This is why actuaries at the Social Security Administration estimate that the current Social Security system cannot meet its long-term financial commitments. Hence, any viable Social Security reform plan --whether it be a wholly public system, a wholly private system, or some combination--must assess pure taxes on current and future workers that are *larger* than those defined by current law.

Much of the impetus for privatization derives from the perception that the low rates of return that Social Security can promise to current and future workers reflects some inherent inefficiency that can be curtailed by phasing the program out (eg. Feldstein, 1996b). This is not the case. Social Security's low rates of return reflect an implicit debt that cannot be revoked, and that must be serviced even if the program is privatized.[2]

WHY MANDATORY IRAS WOULD NOT RELIEVE SOCIAL SECURITY'S IMPLICIT DEBT BURDEN

The existence of Social Security's implicit debt gives important intuition for why rates of return than might be earned in mandatory IRAs are not pertinent to the privatization debate. Below, this intuition is validated with a formal analysis showing that retirement systems based either on mandatory IRAs or on traditional publicly administered defined benefits can be designed so as to have similar implications for national saving and the adequacy of overall retirement incomes.

The analysis is done in two steps. First, the case where mandatory IRAs must be invested exclusively in indexed government debt is analyzed. In this case, I show that introducing mandatory IRAs accomplishes nothing that cannot be accomplished with simple changes to Social Security benefits and taxes. Then, in the second step, I show that expanding the menu of mandatory IRA investment options only serves to change the distribution of capital income risk

2. Mariger (1997) and Geanakoplos et. al. (1998a, 1998b) also make this point. Social Security's implicit debt is growing, a fact that may have contributed to some analysts' mistaken belief that privatization offers unique opportunities to improve Social Security's finances (e.g. Feldstein, 1996b). To the contrary, the change in Social Security's implicit debt has two components: interest on already-accrued implicit debt, and newly-accruing implicit debt. Newly-accruing implicit debt is negative, as current and future workers receive negative wealth transfers from Social Security. Interest on already-accrued implicit debt will accumulate regardless of whether privatization occurs.

across individuals. Hence, even if mandatory IRAs that substitute for traditional taxes and benefits were certain to earn high returns, they would not facilitate an increase in the "average" individual's retirement income.

The analysis ignores issues concerning the cost of administering Social Security. As is discussed later in the paper, to the extent that mandatory IRAs increase the cost of administering Social Security, they are a less effective vehicle for prefunding retirement consumption than are traditional Social Security benefits and taxes.

Mandatory IRAs Invested Exclusively in Indexed Government Debt

A Neutral Privatization Scheme

It has been established that a social security system can be interpreted as mandatory implicit government bond purchases and pure taxes (see table 1). This observation suggests an obvious means of privatizing a viable social security system in the two-period model introduced above. Suppose, for example, that the original social security system is such that generation 0 benefits at the expense of later generations ($PURETAX_0 < 0$ and $PURETAX_g > 0$, (g=1,2,.....)). Then, for generation 1 and each succeeding generation, privatization could be accomplished by eliminating social security taxes and benefits, and requiring that the young buy explicit indexed government bonds

$$(4) \quad B_g = \tau_g W_g (1+\eta_g) / (1+RB),$$

and pay a tax that is precisely equal to social security's pure taxes

$$(5) \quad DMTAX_g^* = \tau_g W_g (RB - \eta_g) / (1+RB).$$

For reasons that will become apparent, the tax (5) will be referred to as a "debt management tax." Note that this scheme simply diverts social security's contributory taxes to mandatory IRAs, relabels social security's pure taxes as debt management taxes, and eliminates traditional social security benefits.

As shown in table 1, cash flows of individuals would be precisely the same under this privatization scheme as would have been the case under the original social security system. The only difference is that explicit government debt would be substituted for implicit government debt (promises to pay retirement benefits) in individual portfolios. (Note that implicit debt associated with a traditional social security system is denoted by BI, whereas explicit debt is denoted by B.) And, with individual portfolios essentially unchanged, rates of return would also be unchanged.[3]

But would the supply of government debt be sufficient to accommodate all mandatory IRA investments? The answer is yes. This is most evident at time 1 when the privatization is initiated. At that time, government debt is higher by the amount of tax revenue that is diverted into the mandatory IRAs of generation 1 members. Otherwise, the assets available to the private sector would be unchanged. In the first period after the program change, therefore, mandatory IRA balances would equal the increase in the supply of government debt.

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3. These findings rely on two assumptions that are not entirely realistic: that individuals know social security's implicit rate of return at the beginning or working life, and that securities exist promising a certain real return on pre-retirement saving. Relaxing these assumptions does not compromise the major point of this section, which is that mandatory IRAs do not offer any unique opportunities for making Social Security more generous or for improving government finances. However, as is discussed later in the paper, relaxing these assumptions does lead to the conclusion that mandatory IRAs would alter the allocation of risk bearing across individuals.

Mandatory IRA balances would equal the increased supply of public debt in later periods as well. This can be seen by identifying all sources of period-to-period changes in public borrowing, and verifying that each source is matched by an equivalent change in mandatory IRA balances. There are three sources of changed public borrowing: reduced tax revenues, increased debt service costs, and reduced outlays for traditional social security benefits. Each of these sources of changed public borrowing corresponds to an equivalent change in mandatory IRA balances. First, reduced tax revenues are matched by new contributions to mandatory IRAs. Second, increased debt service costs are matched by income earned in mandatory IRAs. And, finally, reduced outlays for traditional social security benefits are matched by retirement account withdrawals that maintain baseline levels of retirement income.

This privatization scheme is clearly feasible provided the baseline social security system is feasible. Relative to the baseline, the increase in explicit government debt, equal to mandatory IRA balances, is always finite as a share of GDP.

This special case--where mandatory IRAs are invested exclusively in government securities--makes it readily apparent that substituting mandatory IRAs for contributory taxes and retirement benefits leaves the time path for national saving and national wealth unchanged. Mandatory IRA balances represent an increase in private sector wealth that is equal to the increase in publicly-held debt. Hence, the increase in *explicit* private sector wealth is offset by a decrease in *explicit* public sector wealth. The time path for national saving and national wealth is unchanged.

Privatization per se does not make the viability of fiscal policy less reliant on wage growth. The explicit debt created under privatization imposes an absolute dollar burden on future generations just as does the implicit debt outstanding in the baseline; in both cases, this absolute burden is easier to shoulder the more rapid is wage growth. Likewise, privatization does not necessarily decrease so-called "political risk," as debt management taxes would probably be subject to as much political uncertainty as are social security's pure taxes.

Also, this privatization scheme would have no effect on work incentives. With public pensions, pure taxes drive a wedge between retirement contributions and retirement income. Under privatization, these taxes must be collected to service the increased stock of explicit public debt.[4]

Non-Neutral Privatization Deriving From Non-Neutral Debt Management Taxes

The debt management taxes given in (5) are chosen so that privatization has no real consequences for any generation. More generally, the debt management taxes need only satisfy the condition that their present value equal the wealth transfer made to generation 0:

$$(6) \qquad \sum_{g=1}^{\infty} N_g DMTAX_g (1+RB)^{-g} = -N_0 PURETAX_0,$$

which is true if $DMTAX_g = \tau_g W_g(RB-\eta_g)/(1+RB)$ as in (5).

There are clearly many possibilities for the debt management taxes, each one of which yields a different distribution of resources across generations. But to achieve any particular

4. Many believe that Social Security's pure taxes would be made more efficient if mandatory IRAs were substituted for some or all of Social Security's taxes and benefits. The argument hinges on possibility that individuals overestimate pure taxes levied by the current Social Security system, but would accurately estimate pure taxes levied under a system with mandatory IRAs (Kotlikoff, 1995).

distribution of resources across generations, it is not necessary to privatize the social security system. To see this, suppose the social security system is privatized as above except that the debt management taxes satisfying (6) are

$$DMTAX_g = DMTAX_g^* + \delta_g, \ (g = 1,2,\ldots.),$$

where $DMTAX_g^*$, (g=1,2,...), are the neutral debt management taxes given by (5) and the present value of the deviations from neutral debt management taxes (the δ's) is zero ($\sum \delta_g(1+RB)^{-g} = 0$). Then the distribution of resources across generations yielded by this privatization scheme could be achieved by leaving social security benefits unchanged and changing social security taxes by δ_g on each member of generation g, (g=1,2,...).

Several studies show that privatizing a viable social security system can increase GDP and economic welfare in the long run (e.g., Feldstein, 1995; Kotlikoff, 1995; Kotlikoff, Smetters, and Walliser, 1998). This can be achieved by bringing forward the time path of debt management taxes relative to those that would be neutral with respect to resource allocation. Such a reallocation of the tax burden across generations induces increased national saving (increased prefunding), lower living standards for older generations, and improved living standards for younger generations. As has been demonstrated, the same ends can be achieved by bringing forward the time path of social security's pure taxes and leaving the basic structure of social security unchanged.

Non-Neutral Privatization Deriving From Non-Neutral Mandatory IRA Contributions

The mandatory IRA contributions given in (4) are chosen so that the privatization scheme leads to no change in real retirement incomes. Of course, a privatization plan would involve substantive change if mandatory IRA contributions differed from (4), in which case debt management taxes would necessarily differ from those given in (5). But it is clear that these substantive changes could be implemented by simply adjusting social security benefits and taxes.

Privatizing a Non-Viable Social Security System

Any meaningful analysis of the advantages of privatization must define a viable public social security system as a standard for comparison. It is nevertheless instructive to imagine privatizing a non-viable social security system. In particular, if such a system were privatized as in (4) and (5), the implied time path for explicit government debt would precisely equal the infeasible time path for explicit and implicit government debt under the original public social security system. It follows that privatization by itself cannot turn an infeasible public retirement plan into a feasible private plan without putting the rest of government out of balance.

Expanding the Menu of Investment Options

It has been established that introducing mandatory IRAs invested exclusively in indexed government debt does not offer any unique opportunities for making Social Security more generous or for improving government finances.

But would this conclusion hold up if mandatory IRAs could be invested in risky assets promising high expected returns? To answer this question, imagine starting from a situation where mandatory IRAs are invested exclusively in government securities and then expanding the

menu of investment options. Clearly, some individuals would want to exchange some of their government debt holdings for riskier assets, say private equities. But not everyone can take on more risk. For every seller of government debt, there must be a buyer. And for every buyer of private equities, there must be a seller. Hence, expanding investment options would result in no direct change in national saving, national wealth, or national income.

This is not to say that expanding mandatory IRA investment options would have no macroeconomic effects. The allocation of capital income risk across individuals would be changed, which could lead indirectly to changes in labor supply and consumption decisions. However, any such changes in aggregate variables would probably be modest, and are certainly not a rationale for privatization.[5]

Privatization and Hidden Reductions in Socially-Mandated Retirement Incomes

Often privatization plans are designed to maintain baseline levels of socially-mandated retirement income under the assumption that mandatory IRAs increase private sector wealth in accordance with mandatory IRA balances, and that mandatory IRAs earn returns higher than those paid on government debt. In actuality, however, these plans reduce socially-mandated retirement incomes. And, because Social Security is made less generous, government finances are improved.

To be more specific, consider a privatization plan that allows some portion of Social Security taxes to be diverted to mandatory IRAs, and that reduces Social Security benefits by the

5. Mariger (1997) investigates the implications for national saving of the changed allocation of capital income risk, and concludes that it would be small.

projected annuity value of future mandatory IRA balances under the assumption that mandatory IRAs earn the government borrowing rate plus one percentage point. Then this plan would *certainly* reduce socially mandated retirement incomes, and would *certainly* improve long-run government finances.

To understand this result, recall the neutral privatization experiment in which Social Security benefits are eliminated and Social Security's contributory taxes (those that are not pure taxes) are diverted to mandatory IRAs invested exclusively in government debt. In this case, the private sector's consolidated portfolio is unchanged except for the increased supply of government debt, and mandatory IRA balances are equal to the increased supply of government debt. And expanding the menu of mandatory IRA investment choices has no direct effect on private sector wealth; hence, the increase in private sector wealth attributable to privatization is *certain* to equal to mandatory IRA balances in the hypothetical case where they are invested exclusively in government debt.

The privatization plan described reduces socially mandated retirement incomes because it makes two assumptions that together must be false: that mandatory IRAs earn a return higher than the government borrowing rate, and that the increase in private sector wealth is equal to mandatory IRA balances. As a consequence of these false assumptions, the plan invokes a reduction in traditional Social Security benefits that is larger than would be consistent with a neutral privatization. Hence, the end result is a *certain* cut in socially mandated retirement incomes and a *certain* improvement in long run government finances.

THE PERTINENT ISSUES REGARDING MANDATORY IRAs

Mandatory IRAs have no inherent advantages over traditional social security taxes and benefits with regard to wealth creation. Prefunding retirement consumption in the Social Security trust fund, if that is politically possible, has the same economic implications as prefunding retirement consumption in private accounts.

However, there are four major issues that do distinguish retirement systems that include mandatory IRAs from those that do not. First, mandatory IRAs would have unique implications for the allocation of risk bearing. Second, political constraints might make it impossible to prefund retirement consumption in government accounts, in which case introducing mandatory IRAs would indirectly lead to a more austere overall government fiscal policy and smaller government liabilities. Third, mandatory IRAs could have implications for how government policy redistributes wealth. Lastly, some designs for mandatory IRAs could significantly increase the cost of administering the Social Security system, which could severely limit their efficacy for prefunding retirement consumption. Each of these issues is explored below.

Mandatory IRAs And The Allocation of Risk Bearing

Substituting mandatory IRAs for traditional Social Security benefits and taxes would inevitably change the allocation of risk bearing. Whether this would be good or bad is not clear. Mandatory IRAs might allow risk to be shifted to the individuals who are best able to absorb it. On other hand, mandatory IRAs could enable some individuals to take excessive risks.

Individuals that are likely to take on more capital income risk as a result of mandatory IRA investments are individuals who currently would like to borrow for the purpose of investing

in risky assets but cannot. Such individuals are said to be liquidity constrained, and tend to fall into two groups: young individuals with little privately-managed wealth, and individuals with an unusual tolerance for risk.

In addition, the defined-benefit nature of traditional Social Security benefits and taxes allocate capital and labor income risk in subtle ways that are not captured in the two-period model presented above, and which would be difficult to mimick in a retirement system based on private accounts.

Reallocation of Capital Income Risk Between Young and Old

It has been established that a neutral privatization has no effect on the allocation of risk bearing if mandatory IRAs are invested exclusively in government debt. Hence, the effect of mandatory IRAs on the allocation of risk bearing can be understood by starting from a situation in which mandatory IRA investments are restricted to include only government debt, and then analyzing the effects of lifting that restriction.

If mandatory IRAs must be invested exclusively in government debt, then most young people would have portfolios that are made up almost entirely of government debt. Many of these individuals would be unable to diversify into riskier assets because of borrowing constraints, and would gladly exchange part of their holding of government debt for riskier assets if the restriction on mandatory IRA investments were lifted.

Most older individuals, on the other hand, would have significant wealth outside of their retirement accounts. These individuals would tend to be indifferent to the requirement that their retirement accounts be invested in government securities, as they could balance safe assets held

in retirement accounts with risky assets held outside of retirement accounts. Absent a change in rates of return, therefore, older individuals would tend *not* to reallocate their portfolios if retirement account investment options were expanded to include assets other than government securities.

To summarize, relaxing the restriction that retirement accounts be invested in government securities would affect the young and the old differently. At initial rates of return, young individuals would tend to sell government debt and buy private equities, while older individuals would tend to leave their portfolios unchanged. This situation would be untenable, as the supply and demand for assets would not match. There would be an excess supply of government debt, and an excess demand for private equities. As a result, the return on government debt would rise so that older individuals would be willing to trade some of their holdings of private equities to young individuals in exchange for increased holdings of government debt.

When all is said and done, portfolios held by young individuals would tend to be riskier and promise higher expected returns, and the portfolios of older people would tend to be less risky and offer lower expected returns. This arguably makes good economic sense, as young individuals are better able to adjust to unexpected changes in their financial circumstances than are older individuals.

The increase in the government borrowing rate that would likely accompany a changed allocation of risk would increase government debt service costs. Depending on the nature of offsetting fiscal policy adjustments, the distribution of wealth across generations could be affected. If it is, then there would be implications for national saving and GDP.

Reallocation of Capital Income Risk between Individuals with Different Preferences for Risk

In addition to redistributing capital income risk across individuals of different ages, mandatory IRAs would enable liquidity constrained individuals with unusually high tolerance for risk to take on a larger share of total capital income risk. Some individuals, particularly low-income individuals who are effectively insured against some capital income risk by government benefit programs for the low-income elderly, undoubtedly would choose riskier portfolios than is generally considered prudent. This possibility might argue for some limitations on mandatory IRA investment choices.

Minimum Return Guarantees and the Allocation of Capital Income Risk Across Generations

Some Social Security reform plans provide for a minimum return guarantee on mandatory IRAs. Such a guarantee would affect the allocation of risk bearing in a manner that would probably also affect the distribution of wealth across generations (Smetters, 1998). This would occur if taxes are levied on workers to finance minimum return guarantees paid to the elderly. These wealth transfers are analogous to those at the start-up of a pay-as-you-go social security system. National saving and GDP would probably be reduced relative to a baseline that did not include minimum return guarantees.

Risk Allocation Implications of Substituting Defined Contributions For Defined Benefits

The analysis thus far does not incorporate some real-world uncertainties that generally make it impossible to design a neutral privatization scheme in which mandatory IRAs yield the exact same retirement income does the current Social Security system. (See *"A Neutral Privatization Scheme"* above.) In particular, the implicit real return earned on Social Security

taxes, η_g, (g=0,1,2,....), is not known at the beginning of working life because real benefits depend on a lifetime average for "indexed" covered wages, where the index factors pertain to economy-wide average wages. Also, with indexed government securities available only for limited maturities, assets do not exist that guarantee a real return on pre-retirement saving.

Because of these considerations, the portion of Social Security taxes that a neutral privatization would divert to mandatory IRAs must be selected so as to maintain the baseline level of *expected* retirement income. While it would remain true that a "neutral" privatization would not change expected retirement incomes or expected government finances, it would change the risk characteristics of retirement incomes and government finances for reasons quite apart from those discussed above. It is very difficult to know whether these considerations are a net plus or a net minus for privatization.[6]

Possible Political Constraints That Would Argue For Private Accounts

I have demonstrated that diverting Social Security taxes to mandatory IRAs and reducing benefits in a manner that leaves long run government finances unchanged merely substitutes explicit government debt in private portfolios for benefit promises (implicit government debt). True government liabilities would be unchanged, but voters and elected officials might come to view the government's fiscal stance very differently. If so, then privatization could lead to more austere fiscal policies than would otherwise occur. In this case, privatization would indirectly reduce true government liabilities.

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6. On this score, Merton (1983) and Bohn (1998b) argue that the wage indexing formula determining Social Security benefits under current law increases opportunities for sharing labor productivity risk across generations. Of course, mandatory IRAs would not have this feature.

This possibility is closely related to the question of whether a legislated increase in Social Security trust fund accumulations would add to national wealth. This is a difficult question to answer. If tax increases or benefit reductions boost Social Security surpluses, and if these surpluses do not result in higher levels of spending, or lower taxes, outside of Social Security, then the resulting increase in the trust fund balance each year measures the amount by which federal debt held by the public is reduced.[7] The smaller is the amount of federal debt held by the public at any point in time, the larger is the share of domestic private wealth that represents domestically-owned real capital and claims on foreigners–assets that, unlike government debt, contribute to national income.

On the other hand, political constraints might make it impossible to prefund retirement consumption in government accounts. Some past attempts to prefund Social Security benefits by building up a large Social Security trust fund appear to have been thwarted by new legislation that increased benefits and expanded Social Security eligibility (Cogan, 1998). Perhaps more troublesome is the possibility that Social Security surpluses encourage larger federal deficits (or smaller federal surpluses) outside of the Social Security accounts. If this is the case, Social Security surpluses are neutralized by non-Social Security deficits, and are not truly saved.

There are probably similar but much less severe political impediments to prefunding in private accounts. It might be that any political pressure put on elected officials to invoke policies

7. More generally, if Social Security surpluses do not *cause* larger non-Social Security deficits, then the Social Security surplus in a given year measures the amount by which Social Security reduces the overall unified budget deficit. This reduction has two parts: the excess of Social Security taxes over Social Security benefit payments directly lowers the unified deficit, and the reduction in net interest payments attributable to the lower level of debt held by the public indirectly lowers the unified deficit. The second component of the reduction in the unified deficit corresponds to trust fund interest earnings.

that prevent or neutralize Social Security trust fund accumulations would also be felt with regard to policies that allow individuals access to funds in mandatory retirement accounts for special non-retirement needs like college tuition or a home purchase. However, the personal costs associated with drawing down the Social Security trust fund would probably be less obvious to voters than would be the personal costs of drawing down individually-owned retirement funds early. If so, voters would be less likely to support early access to mandatory retirement account balances than they would policies that limit or neutralize asset accumulation in the Social Security trust fund. Moreover, it is unlikely that individuals would take near to full advantage of opportunities to draw down mandatory retirement accounts early. This is because individuals must save their mandatory account monies in order to make up for their loss of traditional Social Security benefits.

I conclude that if substantial prefunding is desired, and if political constraints make it impossible to prefund in government accounts, then prefunding in private accounts would be a viable option. But is substantial prefunding desirable? I argue below that it is.

Why Prefund?

The present value of Social Security's pure taxes must equal Social Security's current implicit debt. The essential question Social Security reform must address, therefore, is how and on whom these taxes should be levied.

How Social Security's pure taxes are allocated across generations helps determine the degree to which retirement consumption is prefunded. The larger the share of these taxes that are paid by early generations, and the smaller the share paid by future generations, the larger is

prefunding. Increased prefunding, therefore, benefits future generations at the expense of current generations.

Efficiency considerations would argue for fairly uniform marginal pure tax rates across generations (Chari, Christiano, and Kehoe, 1991). For example, if pure taxes are to be levied on wage income, it would be most efficient if each generation paid more or less the same percent of wage income as pure taxes at the margin. This is so because raising a tax rate causes the excess burden of the tax to increase much more rapidly than does tax revenue. Hence, any deviation from uniform pure tax rates harms generations paying high pure tax rates more than it benefits generations paying low pure tax rates.

Most people would probably regard a uniform pure tax rate across generations as roughly fair as well as efficient. Hence, this policy is a useful benchmark that would probably be close to most peoples' preferred policy.[8]

If Social Security's pure tax rates were constant over time, and set at a level that fully services Social Security's implicit debt, then prefunding would be substantial. With a constant pure tax rate, all generations would be asked to prefund the same share of their own socially-mandated retirement income. Because the baby boom generation is extraordinarily large, prefunding would be extraordinarily large as a share of GDP as the baby boom enters retirement and the ratio of retirees to workers rises.

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8. Advocates of progressive tax rates might favor pure tax rates that rise in tandem with projected real wage growth. However, the extent to which pure tax rates can rise with real wages is limited by the loss of efficiency that such a policy would entail. Moreover, some might argue that it would be unethical to impose a disproportionate share of Social Security's implicit debt burden on generations that have no input into current political decisions.

Nevertheless, if pure tax rates were to be constant over time, then Social Security would always carry an implicit debt and retirement consumption would always be partially unfunded. This is a straightforward implication of the fact that Social Security needn't levy any pure taxes when and if Social Security has no implicit debt.

Summary

Both efficiency and equity considerations argue that Social Security should become substantially prefunded as the baby boom approaches retirement. In principle, prefunding could occur in public or private accounts. However, if political constraints preclude the possibility of prefunding in public accounts, then the case for some privatization is compelling.

Mandatory IRAs and Wealth Redistribution

Thus far, it has been assumed that Social Security levies the same pure tax on all members of a given generation. In reality, of course, Social Security's pure tax rates tend to rise with lifetime income (e.g. Steuerle and Bakija, 1994). The progressive nature of the system causes marginal pure tax rates on earnings to exceed average pure tax rates, thereby worsening work disincentives.

It would also be possible to redistribute wealth in the context of a privatized Social Security system. This could be done in any number of ways. If mimicking wealth redistribution under the current Social Security system is desired, it could be done by redistributing retirement account balances at retirement on the basis of lifetime earnings (but not on the basis of returns earned in mandatory IRAs). As with the current system, such redistribution would cause each individual's marginal pure tax rate on work effort to exceed his or her average pure tax rate.

Mandatory IRAs and Social Security's Administrative Costs

Mandatory IRAs could significantly increase the costs of administering Social Security. In 1997, Social Security cost $16 per person (workers and beneficiaries) to administer, or $10 per person excluding the estimated cost of administering the disability program (National Academy of Social Insurance, 1998). How much mandatory retirement accounts would increase these administrative costs is extremely uncertain, and would depend on the level of services that are offered and how the system is organized. Services could vary in a number of ways, including the frequency of retirement account deposits, the number of alternative investment options available, the frequency of interfund transfers that are allowed, the frequency of reporting on accumulated balances, and the amount of investment education that is provided to workers.

A recent study analyzed a plan for mandatory retirement accounts that offers a medium level services would increase Social Security's per-person administrative costs by between $25 and $50, a two to three-fold increase over the cost of administering the current retirement and disability programs (National Academy of Social Insurance, 1998). The plan would have a government agency act as an intermediary between participants (workers and employees) and providers of investment services; would limit investment options to a small number of mutual funds; would make deposits and fund transfers, and report fund balances, on an annual basis; and would provide no investor education beyond distributing information pamphlets.

The costs of administering mandatory IRAs would be much smaller if all individuals were required to invest mandatory IRA contributions in one centrally administered fund. Such a

plan would prefund retirement consumption more effectively than a plan that allows more investment services, as administrative costs absorb resources that could otherwise be saved. On the other hand, plans that allow more investment choices could lead to a preferable distribution of capital income risk across individuals.

PRIVATIZING TRUST FUND INVESTMENTS

To date, the Social Security system has taken in more taxes than it has paid in benefits. The cumulative difference between taxes and benefits as of the end of 1998, the value of special-issue government securities held in the Social Security trust fund at that time, was about two times as large as Social Security benefits paid in 1998. This trust fund accumulated because the baby boom generation is prefunding part of its own retirement, albeit less than would be called for if Social Security were solvent and pure tax rates were constant over time. (As is discussed above, however, trust fund accumulations might not truly contribute to national wealth.)

Several plans have been put forward recently to invest a portion of the Social Security trust fund in equities. Often, these plans are touted as means of improving the government's finances at no cost to the private sector–a free lunch. Below it is demonstrated that a free lunch cannot materialize: trust fund equity investments can improve the government's finances only to the extent that returns earned on the consolidated private sector portfolio are reduced.

As with the introduction of mandatory IRAs, trust fund equity investments would change the allocation of risk bearing. Some analysts argue that these investments would make possible a more efficient sharing or risks between individuals that are currently liquidity constrained and

those that are not. While this possibility cannot be ruled out, I argue that undesirable outcomes are more likely.

No Free Lunch

Investing a dollar of the trust fund in private equities, while leaving taxes and expenditures unchanged, requires that the government issue an additional dollar of debt to the public. Hence, investing the trust fund in private equities amounts to an asset swap: the private sector accepts government debt in exchange for private equities of equal value. Hence, absent a change in private consumption, this asset swap would improve government finances only to the extent that it reduces private sector investment returns.

This conclusion is usefully illustrated for a special case where taxes are frequently modified to reflect the trust fund's investment performance, where there are no liquidity constraints, and where individuals are rational and well informed. In this case, I show that trust fund equity investments are of no real consequence, as all individuals would hedge the government's equity investments so that after-tax incomes and market rates of return are unchanged.

Starting from a feasible baseline in which the government owns no equities, suppose the government at time 0 issues $X of additional debt and buys $X of equities, and changes taxes each year so as to maintain the baseline time path for government net financial wealth (equity minus debt). Consider the effect of this change on an individual who pays the share α of federal taxes. In year 1, this individual's taxes change by his share α of the government's year-1 portfolio loss (perhaps negative):

$$\Delta TAX_1 = -(RE_1 - RB_1)\alpha X,$$

where RB_1 is the certain nominal return on government bonds and RE_1 is the uncertain return on equities. However, suppose this person had increased his or her debt holdings by αX and decreased his or her equity holdings by αX in response to the government's equity investment. Then his or her capital income in year 1 changes by:

$$\Delta INCOME_1 = (RE_1 - RB_1)\alpha X,$$

which exactly offsets the change in taxes.[9] The same logic applied to future years implies that the change in taxes plus the change in capital income would be identically zero in all years for an individual who consciously hedges the government's equity investment.[10]

But would investors hedge the change in the government's portfolio? For someone who owns risk-free assets in the baseline or is able to borrow at the risk-free return, and who is rational and well-informed, the answer is yes. In the baseline, such an individual chooses a mix of debt and equity that best suits his or her tastes. The government's equity investment, if not hedged, would upset this mix; effectively, it would increase the individual's equity holdings and decrease the individual's debt holdings. The individual has the means to neutralize this change, and would rationally do so.

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9. For simplicity, this exposition ignores the effect of taxes levied on private sector capital income. Allowing for these taxes does not change any conclusions.

10. If everyone hedges the government's equity investment, then there would be no net change in the demand for assets and rates of return would remain unchanged. This can be seen by noting that a person who pays the share α of federal taxes reduces his or her demand for equity by αX and increases his or her demand for government bonds by αX. In the aggregate, therefore, the private sector decreases its demand for equities by X and increases its demand for government bonds by X. These changes in asset demands are balanced by equal changes in assets supplied to the private sector.

Possible Changes in the Distributions of Wealth and Capital Income Risk

This example illustrates some basic principles, but is not realistic. While trust fund equity investments would have no direct effect on total capital income, they would inevitably alter the allocations of wealth and capital income risk across individuals. This can be seen by examining the implications of assumptions that differ from those in the example.

Changes in the Wealth Distribution

The example assumes that each individual shares equally in the upside and downside risks of trust fund equity investments. This is extremely unlikely. For example, a particularly troublesome possibility is that Social Security benefits might be increased quickly in response to better-than-expected returns earned by the trust fund, whereas taxes would be increased after a long lag in response to worse-than-expected returns. If so, the size of the Social Security program, and the amount of wealth transfers extracted from unborn generations, would ratchet up over time.

Changes in the Allocation of Capital Income Risk

The example assumes that all individuals can borrow and lend at the risk-free interest rate. Alternatively, if some individuals are borrowing-constrained, then trust fund equity investments might facilitate a more efficient sharing of capital income risk.[11] The idea is that Social Security benefits could be tied to the returns on equity investments, which would enable young borrowing-constrained individuals to trade in safe promises of modest Social Security

11. In addition, trust fund equity investments could be a means of allowing future generations to share in the income and risk of current-vintage capital. Bohn (1998) argues that this would be a desirable risk sharing arrangement.

benefits for Social Security benefits that are less certain, but that are more generous in an expected value sense. In effect, young peoples' overall portfolios, portfolios that include promises of Social Security benefits, would be invested in riskier assets with higher expected returns.

If young individuals are to take on more capital income risk, older individuals must take on less. To see how this would occur, recall that each dollar the government invests in private equities requires that an additional dollar of government debt be sold to the public. The private sector gives up equities in exchange for government debt of equal value. Because young individuals currently hold relatively little equity, it would tend do be older individuals that would make this exchange. Hence, older individuals would have portfolios more heavily weighted toward safe government debt.

Shifting some capital income risk from the old to the young could enhance efficiency. Many young individuals have little privately managed wealth, and are without access to borrowing. These individuals might judge that their current portfolios are too safe, as they are dominated by one asset–the promise of relatively safe Social Security benefits. This asset is purchased with contributory taxes, the part of Social Security taxes that are not pure taxes. Alternatively, if part of the trust fund is invested in private equities, and if Social Security benefits are adjusted to reflect equity returns, then young individuals are effectively allowed to swap promises of Social Security benefits for equities. Many young individuals would undoubtedly welcome this opportunity to take on more capital income risk. And, because older

individuals would willingly trade some of their equities for government debt, they would be made no worse off.

However, the scenario just described is unlikely to accurately describe actual fiscal policy. To begin, the scenario assumes that Social Security benefits are continuously adjusted to offset unexpected changes in the value of the trust fund so that the higher expected returns of trust fund equity investments benefit the same individuals who bear the risk deriving from these investments. This is easy to do in a two-period model because all workers and retirees are homogeneous with respect to age. (See, for example, Diamond and Geanakoplos, 1999.) In the real world, however, this would be difficult. Hence, even if policymakers attempt to allocate up-side and down-side risk to individuals in equal proportions, they would not have the proper instruments to do so.

Moreover, it is not improbable that policymakers would not attempt to allocate up-side and down-side risk to individuals in equal proportions. In particular, as discussed above, trust fund equity investments could become a vehicle for making wealth transfers from unborn generations to currently-living generations.

Finally, any supposition about how trust fund equity investments would affect the allocation of risk bearing would be impossible to verify. Verification would require knowing how Social Security taxes and benefits would be adjusted for every contingency with respect to returns earned on trust fund investments. Unless these contingencies are specified in advance, trust fund equity investments would redistribute wealth across individuals in ways that are both unplanned and unknowable.

CONCLUSIONS

Mandatory private retirement accounts are not a panacea. Diverting Social Security taxes to mandatory IRAs and reducing benefits in a manner that leaves long run government finances unchanged merely substitutes explicit government debt in private portfolios for benefit promises (implicit government debt). Alternatively, mandating that individuals contribute to retirement accounts and not changing Social Security taxes or benefits would add no more to national saving and aggregate retirement incomes than could be achieved with a judicious increase in Social Security taxes and benefits.

Current misperceptions regarding privatization tend to derive from a basic misunderstanding of the nature of a pay-as-you-go social security system. Such a system is often likened to an investment that yields a rate of return. This conceptualization gives the incorrect impression that Social Security can be made more valuable by somehow tapping higher market rates of return. To the contrary, the reason Social Security's rate of return is low is that Social Security conveyed substantial wealth transfers to cohorts born prior to 1937, transfers that must be financed with pure taxes paid by later generations.

On both efficiency and equity grounds, it would be reasonable to maintain a fairly uniform Social Security pure tax rate over time. In this case, the baby boom generation would accumulate substantial wealth to prefund part of its retirement consumption. In principal, this wealth could accumulate in the Social Security trust fund. However, political constraints might make it impossible to prefund in public accounts. If so, the case for some privatization would be compelling.

Mandatory IRAs could have important implications for the allocation of capital income risk across individuals. Capital income risk might to be shifted to the individuals who are best able to absorb the risk. On other hand, mandatory IRAs could enable some individuals to take excessive risks.

If the goal of mandatory IRAs is simply to prefund retirement consumption, that can be done most effectively with a bare-bones plan that limits investments to one centrally managed fund and keeps administrative costs to a minimum. On the other hand, plans that allow more investment choices could lead to a preferable distribution of capital income risk across individuals.

The case for investing the Social Security trust fund in equities is tenuous. Absent a change in private consumption, this policy would merely reshuffle claims to a fixed amount of capital income. And, while simple models suggest that trust fund equity investments could improve the allocation of capital income risk between those that are currently borrowing- constrained and those that are not, it is doubtful that policymakers have the proper instruments or the will to achieve this outcome.

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TABLE 1
TWO INTERPRETATIONS OF SOCIAL SECURITY'S NET PAYMENTS FOR GENERATION g

Conventional Interpretation

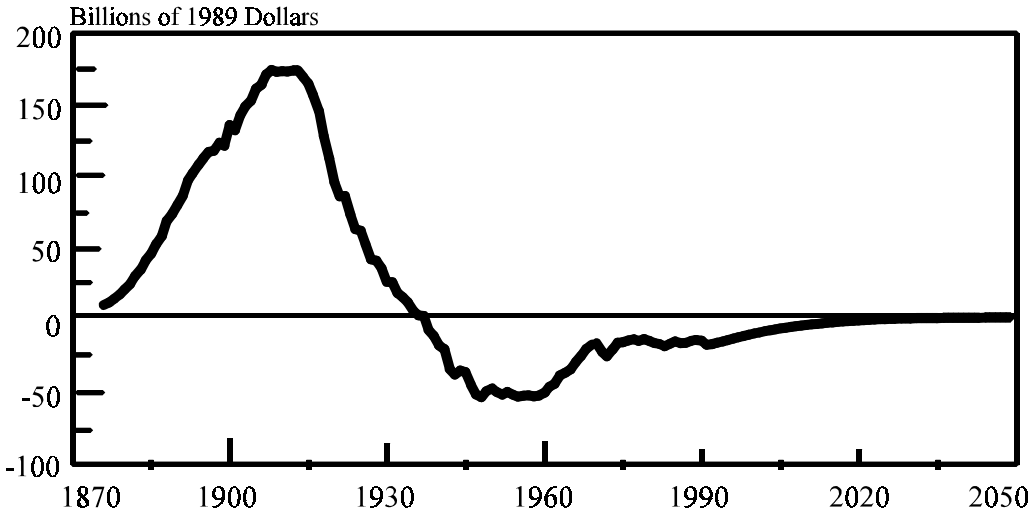
Taxes when young ($SSTAX_g$)	$\tau_g W_g$
Benefits when retired ($SSBEN_g$)	$\tau_g W_g (1+\eta_g)$

Alternative Interpretation

When young	
Forced Implicit Bond Purchase (BI_g)	$\tau_g W_g (1+\eta_g)/(1+RB)$
plus Pure Taxes ($PURETAX_g$)	$\tau_g W_g(RB - \eta_g)/(1+RB)$
equals Net Cash Outflow	$\tau_g W_g$
When retired	
Implicit Bond Proceeds	$\tau_g W_g (1+\eta_g)$

Notes: τ_g is the Social Security tax rate, W_g is the wage, η_g is Social Security's implicit real rate of return, and RB is the real return on government bonds.

FIGURE 1. Social Security's Wealth Transfers by Birth Cohort Adjusted for the Time Value of Money (Billions of 1989 Dollars)



Source:Leimer (1994).