The Transition to Private Market Provision of Elderly Entitlements

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Workers paying taxes today can derive no assurance from trust funds that they will receive benefits when they retire. Any assurance derives solely from the willingness of future taxpayers to impose taxes on themselves to pay for benefits that present taxpayers are promising themselves. This one-sided 'compact between the generations,' foisted on generations that cannot give their consent, is a very different thing from a 'trust fund.' It is more like a chain letter.
—Milton and Rose Friedman, *Free to Choose*, 104

Elderly entitlement programs the world over bind generation to generation through the mediation of government. The typical elderly entitlement program is financed by generation transfers, in which government taxes the young and transfers the proceeds to retirees. In the United States, retirees rely on the young for their Social Security pensions. In exchange for their taxed away earnings, the young are given the implicit promise that they, too, will receive a pension in their retirement. One of the intrinsic defects of elderly entitlement programs financed with generation transfers is that their financial health is very sensitive to demographic changes. The retirement of the baby boom generation will usher in a decreased worker-to-retiree ratio. Combined with increased life expectancies and reduced birth rates, the falling worker-to-retiree ratio is expected to continue for the foreseeable future. These demographic shifts will place elderly entitlement programs in deep financial crisis. Taking Social Security and Medicare in the United States for example, scheduled tax revenues will fall dramatically short of the resources required to pay promised benefits. Fundamentally, the problem of financial insolvency of these programs lies in the fact that they are financed by intergenerational transfers rather than by resources based on saving and investment.

Given the fact that generation transfer systems in effect throughout the developed world will be in serious deficit early in this century, the potential exists for a significant increase in the share of total income that passes through government. In the United States, for example, if benefits for Social Security and Medicare are paid as currently scheduled, the government's share of gross domestic product will increase from its current level of 18 percent to 37 percent within a generation. By way of comparison, the federal government was 10 percent of gross domestic product prior to World War II, rose to 45 percent in 1944, but fell back to 14 percent following the cessation of hostilities. The increase in the share of total production that must pass through government as a result of generation transfers has the potential of being the next great usurper of private property.

The looming financial crisis of elderly entitlement programs can be resolved without creating more government interference in the economy by transforming these programs into retirement systems of privately owned savings accounts. The benefit from a change to a prepaid retirement system occurs in the long run, whereas the burden of the change would fall largely on current workers and near-future generations. Why such a change would be desirable and how such a change could be realized are the topics of this paper.

The main benefit of a transition from publicly provided old age pensions to privately owned retirement accounts comes from the increase in the nation's capital stock as a direct result of the transition. Thus, a necessary, but not sufficient, condition for supporting the abandonment of our current pay-as-you-go system of financing elderly entitlements in favor of a system of private accounts is that in the long run both the retired and working generations will enjoy greater consumption. This condition will be satisfied after the transition because all generations that come after the completed transition will be free from any debt implicit in a transfer-financed public pension system.

Assessing the cost of transition that must be borne before we reach the point where all post-transition generations are completely relieved of the implicit debts is not as straightforward as it may seem. Any reform must be compared with a benchmark that is itself sustainable. Social Security and Medicare, with the existing benefit and tax schedules, cannot serve as such a benchmark because neither program, without significant benefit cuts or tax hikes, is financially solvent. The real costs of transition are those that transitional generations must bear that are above and beyond the sacrifice they would have to make to maintain a solvent transfer-based entitlement program. Nevertheless, since both the real costs of transition and the costs that must be incurred to bring about a sustainable generation transfer system have to be paid by the transitional generations, the sum of both is often referred to as the transition cost.

As of January 1, 2003, the existing members of the Social Security system are owed a debt of $11.9 trillion. This debt, equal to the present value of bene-

fits in excess of tax payments, must either be paid or reneged upon if future generations are to be put in a new retirement system based on privately owned accounts. However, even absent any transition to a prepaid retirement system, the $11.9 trillion Social Security debt exists and must be paid, again through a combination of increased taxation and/or benefit reductions. In a sense, a transition to benefit prepayment does not generate any additional costs but only brings forward the pain of paying off the existing debt.

In all reform proposals that envision a transition to a retirement system based on privately owned savings accounts, the fundamental issue is how the transition costs should be distributed among transitional generations. In this paper, we study three transitions from the current pay-as-you-go system of financing elderly entitlements to a system of private accounts. In our analysis, we focus on aggregate quantities and intergenerational equity, therefore implicitly treating individuals of the same generation as identical. A concern expressed by opponents of Social Security privatization has been that general private individual account retirement systems, such as the ones presented in this paper, tend to be less redistributive than current public systems.[1] While intragenerational equity is not a consideration in this paper, the issue of intragenerational redistribution can be handled within a system of individual accounts where the aged poor are treated in a manner similar to the non-aged poor.[2]

The remainder of this paper is organized as follows. First, we introduce some simple financing identities of generation transfer programs and their implications, followed by a general discussion of the benefits and costs of converting a generation transfer program into a prepaid system with private savings accounts. Then, using prepaying current U.S. Social Security as an example, we analyze various aspects of a transition.

SOME SIMPLE ACCOUNTING OF GENERATION TRANSFER SYSTEMS

To understand some of the constraints of intergenerational transfer programs, we present below some simple financing identities of generation transfer systems. For this purpose, we divide the current and the future population into two groups: the "closed group," consisting of the current adult population (those fifteen years and older), and the "new group," consisting of the current pre-adult population and all yet-to-be-born generations. At the same time, we shall refer to the union of these two groups (all current and future generations) as the "open group."

Denote the present time as t_0. For any intergenerational transfer program, since the closed group and the new group do not intersect, open group income (OGI) at any time $t \geq t_0$ can be expressed as the sum of closed group income (CGI) and new group income (NGI). In the same manner, open group expenditure (OGE) at that same point in time can be expressed as the sum of the

closed group expenditure (*CGE*) and new group expenditure (*NGE*). Thus,

(1)
$$OGI_t = CGI_t + NGI_t,$$
$$OGE_t = CGE_t + NGE_t.$$

Define the open group unfunded obligation (*OGUO*) at time t_0 as the present value of the difference in open group expenditure and open group income from the same point in time into the indefinite future. We have then that

(2)
$$OGUO_{t_0} = \sum_{t=t_0}^{\infty} \frac{OGE_t - OGI_t}{(1+r)^t},$$

which from (1) can be written as

(3) $$OGUO_{t_0} = \sum_{t=t_0}^{\infty} \frac{CGE_t + NGE_t}{(1+r)^t} - \sum_{t=t_0}^{\infty} \frac{CGI_t + NGI_t}{(1+r)^t} = \sum_{t=t_0}^{\infty} \frac{CGE_t - CGI_t}{(1+r)^t} + \sum_{t=t_0}^{\infty} \frac{NGE_t - NGI_t}{(1+r)^t}.$$

Defining the first and second summations on the final right-hand side of (3) as the time t_0 closed group unfunded obligation ($CGUO_{t_0}$) and new group unfunded obligation ($NGUO_{t_0}$), respectively, we have

(4)
$$OGUO_{t_0} = CGUO_{t_0} + NGUO_{t_0}.$$

The above open group unfunded obligation, calculated as the present value of present and future scheduled expenditures less scheduled income, is often referred to as the infinite horizon financing shortfall of a transfer-financed entitlement program. As a component of the $OGUO_{t_0}$ and calculated as the present value of the difference between closed group expenditures and income, the closed group unfunded obligation is referred to by the Social Security and Medicare trustees as the 100-year closed group debt because of its similarity to government debt that is held by the public.[3]

Define a sustainable generation transfer system as one with an open group unfunded obligation of zero. When we begin the discounting process, the closed group contains all the current taxpayers and transfer recipients. As the system ages, the proportion of the closed group that provides income to the system falls as taxpayers become transfer recipients. Thus, even in a sustainable system, the closed group unfunded obligation is always positive. Therefore, in a sustainable system we know from (4) that the new group unfunded obligation must be negative and equal in absolute value to the closed group unfunded obligation. Not a surprising result, since for all $t > t_0$ and less than the age at which benefits are paid, the new group contains no recipients, only taxpayers. We shall use this simple arithmetic of generation transfer systems later.

In general, because of a worldwide boom in population that occurred in the period often dated from 1946 to perhaps 1964, social security systems around the world have scheduled tax rates that are below the tax rate that will be required to pay future scheduled benefits. The existence of this baby boom

may well have led Paul Samuelson to say, "Social Security is squarely based on what has been called the eighth wonder of the world—compound interest. A growing nation is the greatest Ponzi game ever contrived. And that is a fact, not a paradox." (*Newsweek*, February 13, 1967)

Since the baby boom did not continue, at scheduled tax rates and benefits, newcomers to the system will contribute little or nothing to pay off the debt owed to the closed group. As an example of this fact, we show in Table 1 the three unfunded obligation measures defined above for the present U.S. Social Security system based on the 2003 Trustees Report.[4] As the table indicates, the U.S. system, similar to all other retirement systems in the developed world, has a long-run problem indicated by the fact that the new entrants to the system will provide no resources to pay off the closed group debt. Whether or not the system is reformed, the debt owed to the closed group must be either paid or canceled. If current members are allowed to receive promised benefits while paying only scheduled taxes, new members' taxes must be raised because the retirement of current members will consume real resources.

For a system that is financially sustainable, there would be no financing shortfall, and therefore, the 100-year closed group debt would be paid off by new entrants to the system so that

$$(5) \qquad CGUO_{t_0} = -NGUO_{t_0}.$$

This constraint on any solvent entitlement program highlights the zero-sum nature of closed group debt financing: If we want to reduce the financial burden on future participants (the new group), the debt owed to current participants (the closed group) must be partially revoked, either by reducing the benefits or increasing the taxation of closed group members. The fact that the new group unfunded obligation is approximately zero indicates something else that may not be obvious: At the current tax rate, if the surpluses in the early years of the new group were invested at the assumed discount rate, the resulting fund would be sufficient to pay scheduled benefits. Thus, while the tax rate is not sufficient to fund a generation transfer retirement system, it is sufficient to fund a prepaid retirement system.

Table 1

U.S. Social Security System Financing Shortfall and Its Decomposition

(Present values as of Jan. 1, 2003, in trillions of dollars)

Open group unfunded obligation (financing shortfall)	$11.9
Closed group unfunded obligation (100-year closed group debt)	$11.9
New group unfunded obligation	$0

THE BENEFITS OF PREPAYING WITH PRIVATE ACCOUNTS

Several reasons have been put forward in favor of prepaying Social Security with private savings accounts. The first and foremost among these is that, absent a contract with unborn generations, members of a cohort must provide for retirement by storing output, essentially acquiring capital, during their productive years. Thus, the movement to advance funding will increase the capital stock relative to its current level and allow future generations to earn higher income. The huge debt implicit in the current retirement system, in the form of accrued benefits, has replaced this need to acquire capital so that future generations inherit a smaller capital stock and have lower income. Essentially, a transition to prepaid retirement benefits with private accounts will bring forward the debt-servicing schedule and hence, increase the nation's capital stock. The debt-retirement benefits from a transition to prepaid benefits will be discussed in detail in a later section where three transition paths for Social Security are simulated.

A second reason for prepaying with private savings accounts is to resolve the current programs' financing crisis without increasing government's share in the economy in the form of publicly operated intergenerational transfers that bind one generation to another. But, one might ask, why is it undesirable to bind generations together through government? In the context of reforming Social Security, it is appropriate to rekindle some of Thomas Jefferson's thoughts as they relate to binding one generation to another. Jefferson was a champion of freedom, and his intellectual curiosity led him to comment on a broad array of topics, including Social Security. Well, maybe not Social Security in particular, but in an intriguing letter to James Madison, Jefferson develops the proposition "that the earth belongs in usufruct to the living: that the dead have neither powers nor rights over it."

Though this proposition may appear on the surface to have no direct application to a generation transfer program such as Social Security, Jefferson's development of the concept reveals a keen insight into the problems and the philosophical implications of binding one generation to another via long-term debt. In terms of debts, Jefferson states in the same letter, "Then no generation can contract debts greater than may be paid during the course of its own existence." Jefferson's logic was that if a generation could leave a debt to the next generation upon its death, "then the earth would belong to the dead and not the living generation."[5]

Social Security binds one generation to another by always leaving a debt to the incoming generation. The debt is the implicit promise to pay benefits to retirees. Each retiree holds an implicit bond equal to the expected present value of his or her benefits. It is the substitution of these implicit bonds for capital that represents the true cost to society of generation transfer-based retirement systems. By endowing the initial generation of beneficiaries with pensions, the continuation of the system results in each new generation inheriting a debt. The debt is never fully

retired by the working generation, for as its members pay for the benefits of re-tirees, they accrue benefits of their own that become debts of the next generation.

A third and often argued reason for prepaying is that it can reduce the welfare loss due to payroll taxes by eventually lowering or eliminating the tax. The negative incentive effects of the payroll tax have been used in the reform debate to argue that it may be possible to have a Pareto-improving transition of the current public Social Security system to a prepaid system with private savings accounts in the sense that all the living and future generations are made better-off. Absent the possibility of a Pareto transition, some arbitrary relative value of the welfare of current versus future generations is implied by a move to private markets.[6] Several studies have claimed that such a Pareto-improving transition is not possible,[7] whereas others have found such Pareto-improving transition paths through simulation and attributed the sources of these "win–win" transitions to some sort of preexisting distortion in the economy.[8]

In Liu, Rettenmaier, and Saving (2000), we used an analytical framework with both labor and capital market distortions to investigate the possibility of a Pareto-improving transition. We found that when the links between Social Security payroll tax contributions and Social Security benefits are sufficiently weak, privatization will yield a Pareto-improving efficiency gain by simply replacing the implicit debt with explicit debt without increasing the nation's capital stock. In essence, the Social Security debt has to be serviced with or without private savings accounts, but the issue is that the current system links this debt-servicing tax to payroll, while under a reformed system, a general tax would play this role. As we know, the payroll tax is bad in that it punishes productive behavior. With the payroll tax replaced by the less distortionary general tax, there can be an efficiency gain in which every generation can be made better-off.[9] However, since one could always replace an inefficient tax with a more efficient one, such a change should not be a benefit of the transition.

Finally, one may think that the benefits of prepaying can be achieved by government investing a trust fund in the capital market rather than through the establishment of private accounts. This is doubtful since for one thing, the government has never been able to do so. Today, in fact, the relatively modest Social Security Trust Fund consists entirely of Treasury IOUs. Even if it were possible for the government to commit to investing in real assets, giving the federal government the green light to invest in our nation's equities would raise a number of issues concerning the separation of the government and the private sector, with the danger of politicizing firm decisions.

THE COSTS OF THE TRANSITION

It does not necessarily follow that every generation would be better-off with a transition from an existing public pay-as-you-go elderly entitlement system to

a system of private individual accounts, even though a significant increase in lifetime consumption could occur in the long run after the reform. The key to understanding the necessary sacrifice that must be made during a transition is the "transition cost" that must be incurred to deal with the debt implicit in the promised benefits of the existing pay-as-you-go system.[10]

Any transition from a generation transfer system of retirement to one in which individuals in each birth cohort provide for their own retirement must deal with the debt of the old regime. As we show above, this debt—the closed group unfunded obligation—can be measured by calculating the present value of net benefits to existing generations. This calculation considers everyone currently in the system and allows them to remain in the current system. The debt owed to this group is referred to as the 100-year closed group debt and has been estimated to be $11.9 trillion in 2003. We have also shown that, in a generation transfer system that is financially solvent, the net contribution of new entrants will exactly equal the 100-year closed group liability. In fact, the projected net contribution of new entrants to the U.S. Social Security system is essentially zero.

This unfunded retirement system debt is only partially the result of pay-as-you-go financing. The larger-than-normal baby boom working generation also plays a role because its tax rate, while sufficient to fund the retirement of a relatively small retired generation, will be woefully insufficient to fund the retirement of the large baby boom generation. For example, the current U.S. Social Security system provides retirement benefits equal, on average, to an income replacement rate of 42 percent. The trustees estimate that as early as 2030, there will be only two workers for each retiree, which implies, in equilibrium, a tax rate of 21 percent. In contrast, the current tax rate is 10.7 percent, just over half the tax rate that will ultimately be required.

To put this problem in perspective, let us combine the two major elderly entitlement programs in the United States. Table 2 shows the resulting financing shortfall for Social Security and Medicare and its decomposition between the closed and new groups. The present value of accrued benefits owed existing members of the system is $24.4 trillion. The present value of the scheduled net cost of newcomers is $25.3 trillion, making total unfunded obligations almost $50 trillion, more than fifteen times the acknowledged federal debt.[11]

One way to deal with an accrued elderly entitlement debt is to bite the bullet and raise taxes immediately by an amount sufficient to amortize the entirety of future promised benefits. This approach requires a tax rate greater than the actuarial deficit reported by the trustees because their actuarial deficit is only adequate to take the system 75 years into the future. Since the system is in substantial deficit at the end of 75 years, a much greater tax increase would be required to ensure solvency in the long run. This year, for the first time, the trustees reported the perpetuity actuarial deficit for Social Security. At the

Table 2

U.S. Social Security and Medicare System Financing Shortfall and Its Decomposition

(Present values as of Jan. 1, 2002, in trillions of dollars)

Open group unfunded obligation (financing shortfall)	$49.7
Closed group unfunded obligation (100-year closed group debt)	$24.4
New group unfunded obligation	$25.3

assumed 3 percent real discount rate, the trustees report that a once-and-for-all increase in the tax rate of 3.8 percentage points would make the U.S. Social Security system solvent forever. However, such an approach is doomed to failure if the increased taxation is not accompanied by investment in the real economy of the early surpluses generated by the new taxation, coupled with a real property right assignment of this new capital.

Given that private savings accounts have to be established for the new entrants to the workforce, the choice among alternative transition paths is simply an issue of intergenerational equity: how the burden of the $11.9 trillion Social Security debt—the burden of the transition costs—should be distributed among present and future generations. In one extreme case, the current U.S. Social Security system could be replaced by letting new entrants have private accounts and allowing all those currently in the system to remain and receive full promised benefits and pay existing tax rates. For this transition, new entrants would have to provide the entire $11.9 trillion to existing generations in addition to providing funds for their own retirement. Any transition to a system of private accounts, while maintaining scheduled benefits and taxes, leaves currently living generations with the status quo but makes future generations worse off. If we are to succeed in finding a transition that has any potential for being intergenerationally equitable, we must include some or all of the current generations in the transition.

Consider another extreme case where the current U.S. Social Security system is replaced by letting new entrants have private accounts and giving all those currently in the system recognition bonds worth a total of $11.9 trillion. Assume a new consumption tax is raised to service the debt. In doing so, all the living generations, including both current workers and retirees, share with the future generations in paying for the burden of financing the $11.9 trillion Social Security debt. In essence, the debts owed to both current workers and current retirees are partially reneged. However, a transfer-based pension arrangement tends to take on a life of its own and is extremely hard to make smaller or to eliminate. It is hard to take benefits away from current retirees, given they have reduced earnings capacity and have adjusted their savings behavior in light of

the expected transfers. It is also hard to reduce the scheduled benefits of near-term retirees because they have also already planned their lifetime savings behavior assuming that Social Security would be there for them. Therefore, it may be argued that dealing the current and the soon-to-be retirees an unexpected financial blow may be politically infeasible.

Between these two extremes, a middle-of-the-road alternative is to let the current retirees and those workers fifty-five years and older remain in the current system by having them receive scheduled benefits and pay scheduled taxes as well. In contrast, private savings accounts would be established for workers fifty-four years and younger and new entrants as they come. At the same time, both the young workers and the future entrants will pay for the phaseout of the current system until all those who are currently fifty-five years and older have exited the current system.

The approach taken by most reformers is a variant of the alternative transition paths discussed above. These reform plans require future (and in some cases current) workers to establish private savings accounts for their retirement expenses, give up the right to some or all of their generation transfer benefits, and pay taxes sufficient to support current and soon-to-be retirees. Assuming that desired retirement income is greater than or equal to the future value of the new mandatory savings accounts, this new saving will result in additions to the capital stock and increased national income.

The increased national income will eventually allow for increased consumption. Feldstein and Samwick (1997), and subsequently Feldstein, Ranguelova, and Samwick (1999), have suggested that all current workers establish mandatory personal retirement accounts (PRAs) and continue paying payroll taxes at the current rate. Initially, the contribution rate to the private accounts, as a percentage of wage earnings, is low—in the range of 2 percent. As funds accumulate in the private accounts, two things happen. As the system matures, the annuities that can be purchased at retirement offset an increasing proportion of scheduled Social Security benefits, thus reducing the financing requirements of the current system.

Assuming that they are required to pay the full cost of paying retirees benefits, current workers bear a greater burden than they would under the pay-as-you-go system, but future workers would be much better off under a prepaid system than under the current system. So, such a transition is not necessarily Pareto-improving. The gradual reduction in the payroll tax will reduce the deadweight loss due to the reduced labor supply under the current tax rate. Feldstein and Samwick (1997) estimate the efficiency gains from such tax rate reduction to be about 2 percent of the tax base.

Kotlikoff and Sachs (1998) have offered another transition path. Focusing exclusively on the retirement portion of Social Security, they suggest eliminating the payroll tax and replacing it with mandatory contributions to private

accounts. The transition cost associated with the accrued benefits would be financed by a new federal business cash flow tax. Since both retirees and workers engage in consumption expenditures, the tax burden for the transition is shared by both workers and retirees. In addition, the business cash flow tax is less distortionary than the payroll tax, and therefore, the switch in the tax by itself produces an efficiency gain. Over time, the tax rate associated with the new cash flow tax would decline as the liabilities of the phased-out system are eliminated.

The President's Commission to Strengthen Social Security (2001) suggested that private accounts offset some of the accumulated debt. More important, however, the commission also suggested that rather than replace a constant share of wage-indexed earnings, the defined benefit part of Social Security provide a fixed level of purchasing power. This change alone reduces the outstanding debt to existing generations, the 100-year closed group liability, significantly reducing the tax required and reducing the cost to both new and existing generations. Such a change is one way of recognizing the fact that the existing system is not sustainable and, therefore, is not the appropriate target when deciding whether a transition is Pareto.

For example, by 2021, just four years after the trustees forecast that Social Security revenues will fall short of benefit payments, the Treasury will have to transfer to Social Security the equivalent of 5 percent of all projected federal income tax revenues. Historically, the largest such transfer has been 4.5 percent of federal income tax revenues (in 1978 and 1983). In both these years scheduled benefits were cut, and in 1983, taxes were also raised. Figure 1 shows the transfers as a percentage of total projected federal income tax revenues that will be required to pay scheduled benefits for Social Security and both parts of Medicare, based on the 2003 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*. Together with Medicare, the Treasury will, in 2020, be transferring to the elderly the equivalent of 17.5 percent of total income tax revenues and by 2030, 36.5 percent of all federal income tax revenues. In contrast, this year, these programs contributed to the Treasury revenues equal to 0.5 percent of total income tax revenues. Thus, to require that all current participants receive full scheduled benefits, in assessing whether or not the transition to private accounts can be made on a Pareto-improving basis, is probably an unfair requirement.

THREE TRANSITIONS TO FULLY FUNDED SOCIAL SECURITY

The preceding discussion identified several possible transitions from the current pay-as-you-go financing of elderly entitlements to a system of private accounts that prepay some or all Social Security benefits. In the discussion that follows, we present three transitions based on the current U.S. Social Security system.

Figure 1

General Revenue Transfers to Social Security and Medicare
*(as a percentage of income taxes)*

Percent
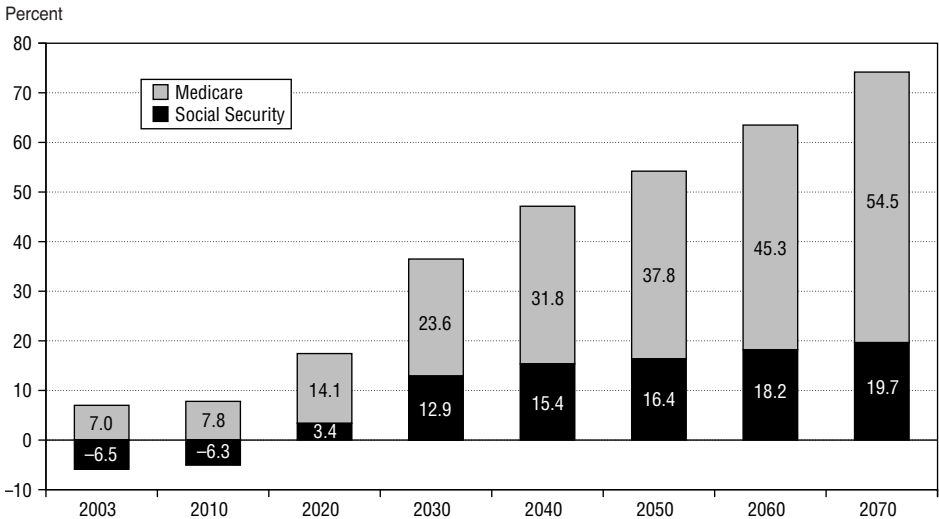
        The first transition, **Reform I**, keeps intact the benefit structure for all
those currently in the system (those fifteen years and older) but lets the tax rate
be constantly adjusted so that revenues are always equal to expenditures, that
is, the tax rate is set at what the trustees refer to as the cost rate. By letting those
currently in the system pay the cost rate, they participate in paying some of the
100-year closed group liability.
        At an assumed rate of return of 5.4 percent (the return on a 60 percent
equity, 40 percent bond portfolio over the past sixty years), the required con-
tribution rate to yield a 42 percent replacement rate is 4.22 percent. We assume
that all individuals under age sixty-seven pay the tax rate required to pay sched-
uled benefits—the trustees' cost rate. We further assume that all new entrants
to the system get no benefits from the old system, are required to place 4.22
percent of their income into a private account and pay the cost rate that is nec-
essary to pay benefits to the closed group. As the population eligible for gen-
eration transfer benefits falls, the tax rate will begin to decrease and reach zero
in 100 years, when the last of those currently in the system are expected to be
deceased.
        Figure 2 contrasts the cost rates with this reform to the cost rates neces-
sary to maintain the status quo pay-as-you-go financing. The first two series to
consider are the status quo cost rate and the closed group cost rate. The status

Figure 2

Income and Cost Rates for the 100-Year Closed Group and for
Future Generations with a Reform That Pays Off 100-Year Closed Group Debt

Percentage of taxable payroll
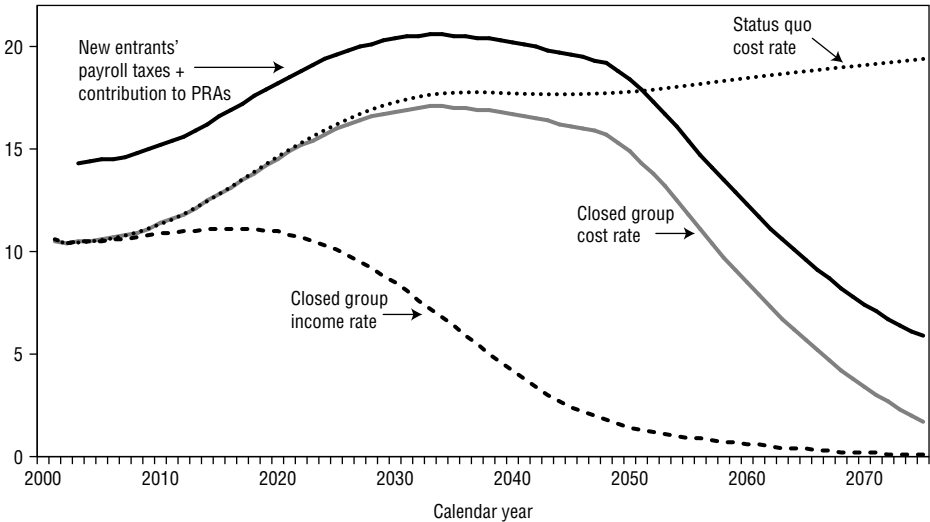
SOURCE: 2001 Social Security Trustees Reports and SSA 2001 Cohort Operations file.

quo cost rate reveals the prominent increase in spending as a percentage of taxable payroll between 2010 and 2030 that is associated with the retirement of the baby boom generation. The status quo cost rate continues to rise after 2030 but at a slower rate. The closed group cost rate shows the share of the status quo cost rate that is attributable to the members of the closed group: individuals who are fifteen and above today. As this series indicates, the cost of making benefit payments to this group rises to 17 percent of payroll by 2034 and then begins to fall. By 2075, the cost is about 2 percent of payroll, and 100 years out, the cost has dropped to zero. The difference between the status quo and closed group cost rate is the costs associated with new entrants to the system.

The top cost rate shows the time path of the new entrants' combined payroll taxes and their contributions to private accounts. Their taxes and contributions start at 14.3 percent of taxable payroll and rise to 20.6 percent by 2034 and then decline until they ultimately fall to the contribution rate required to fund their personal retirement accounts. The figure shows that until 2052, the combined costs for newcomers are in excess of what they would have paid under the status quo. The final line in the graph shows the total taxes paid by the closed group represented as a percentage of taxable payroll. Currently, the

closed group accounts for 100 percent of all taxpayers, but as time goes on, members of the closed group retire and stop paying taxes, as reflected by their declining income rate.

Table 3 shows three estimates of the present value of the 100-year closed group expenditures and income for the existing Social Security system and the **Reform I** program in which members of both the closed group and the new group pay the cost rate. The closed group debt, as measured by the trustees and shown in the column labeled "conventional" in the table, is $11.9 trillion. However, this debt treats the surpluses generated between 2003 and 2017 as if they are invested in real assets. In reality, these surpluses are simply spent by Congress and no investment occurs. Thus, the correct measure of the debt, with the surpluses eliminated, is $13 trillion, as shown in column 2 of the table. Finally, the reformed system, in which the closed group pays the cost rate, has a closed group debt of $11.8 trillion. Thus, by requiring the closed group to pay the cost rate that is necessary to pay their benefits, the group pays off some of its debt with **Reform I**, but it still leaves a little over 90 percent of the debt to new entrants.

Under **Reform I** the first newcomers are worse off, since their taxes plus contributions are higher than would have been required to keep the generation transfer system intact throughout their work life. Further, it is not until 2060 that total taxes by the new group are less than the current legislated tax rate. However, it should be emphasized that this legislated tax rate is insufficient to keep the generation transfer system solvent. This first example of a total prepayment reform illustrates two significant aspects of any reform. First, it illustrates the share of the closed group liability that, assuming no changes in scheduled benefits, can be paid by having the closed group's taxes rise with the cost of pay-

Table 3

Three Estimates of the 100-Year Closed Group Unfunded Obligation in 2003

Category	Conventional	Surpluses Not Included	*Reform I*
Present value of revenues	13.9	12.8	14.0
Present value of expenditures	25.8	25.8	25.8
Remaining closed group debt	−11.9	−13.0	−11.8

SOURCES: Social Security Administration 2001 Cohort File and 2003 Trustees Report. The column titled "Conventional" is the standard way of calculating the obligation. The next column sets the income rate to the cost rate between 2003 and 2017. The third column does not include the surpluses either, but it does impose the closed group cost rate on members of the closed group beginning in 2018. None of the estimates include the Trust Fund offset as a revenue source.

ing their benefits. Second, it illustrates the burden placed on new entrants if they are required to both pay off the remaining closed group debt and, at the same time, prepay their own retirement.

A significant shortcoming of **Reform I** is that it treats members of the closed group and newcomers differently. It is unlikely that explicit differential "tax" rates in any given year, such as those in the previous example, would be acceptable to taxpayers. Most reform proposals envision either identical mandatory contribution rates to private accounts or equal percentage contributions paid from one's payroll taxes. Either way, all taxpayers are treated the same in a given year. Reforms that include private accounts can also take the form of either partial or total prepayment.

We turn now to analyzing a partial prepayment and another full prepayment reform. An example of a partial prepayment reform is the second reform put forward by the President's Commission to Strengthen Social Security, which we will refer to as **Reform II**. That reform would allow workers to contribute roughly 31.7 percent of their payroll taxes, 4 percentage points of the total 12.6 percent payroll tax, up to $1,000 per year, to a private account. With the restriction of $1,000, the total contributions to private accounts ultimately reach 2.39 percent of taxable payroll. The reform also replaces the wage-indexed benefits formula with a price-indexed formula beginning in 2009. Price indexing effectively sets the defined benefit after 2008 to the real purchasing power of the 2008 benefit.[12] In exchange for the opportunity to divert one's payroll taxes to a private account, the price-indexed benefit is offset by the annuity resulting from one's private account, assuming the private account earns 2 percent. Future benefits are first reduced by the new benefit formula and are then further reduced by the benefit offset, assuming the 2 percent rate of return. Any accumulations earned in excess of the 2 percent are added to the reformed benefits to arrive at a retiree's total benefit. Using the commission's assumptions, the ultimate benefits from this reform are roughly comparable to those currently scheduled.

In the calculations reported below, we assume 100 percent participation and that any funding shortfalls are made up using payroll taxes. While the shortfalls could be financed in any way—for example, income taxation—we use payroll taxation to make the results of this reform comparable to **Reform I** discussed immediately above. The use of payroll taxation makes the closed group pay less of their liability than general income taxation because, with income taxation, even the retired population participates in paying off the debt.

In our second example of a full prepayment reform, **Reform III**, we require all future participants and all current participants fifty-five years of age and younger to contribute 4.22 percent of their payroll to a private account. In addition, both future and current participants pay payroll taxes equal to the cost rate. With this contribution rate, the annuity that a new entrant could purchase

at retirement would be roughly equivalent to scheduled benefits.[13] At the same time, scheduled benefits are reduced by the expected value of the annuity that this contribution rate would purchase.[14] In this way, individuals in the closed group fifty-five years of age and younger prepay part of their retirement pensions. It should be emphasized that the average annuity that can be purchased using the personal retirement account accumulations identifies the benefit reduction schedule for **Reform III**. This benefit reduction schedule is pre-announced and is part of the reform and is thus similar to the pre-announced change to the price-indexed benefit formula in **Reform II**. Each successive cohort knows at the beginning of the reform the expected size of their tax-financed defined benefit.

Figure 3 illustrates the cost rates resulting from the President's Commission, **Reform II**, and the second full prepayment reform, **Reform III**. The two reforms' cost rates shown in Figure 3 illustrate how each reform reduces cost relative to the cost of paying scheduled benefits. As expected, the larger contribution rate leads to a more dramatic and rapid reduction in the cost of the pro-

Figure 3

Cost Rates for Status Quo and for Two Reforms
When All Costs Are Paid Using Payroll Taxes

Percentage of taxable payroll
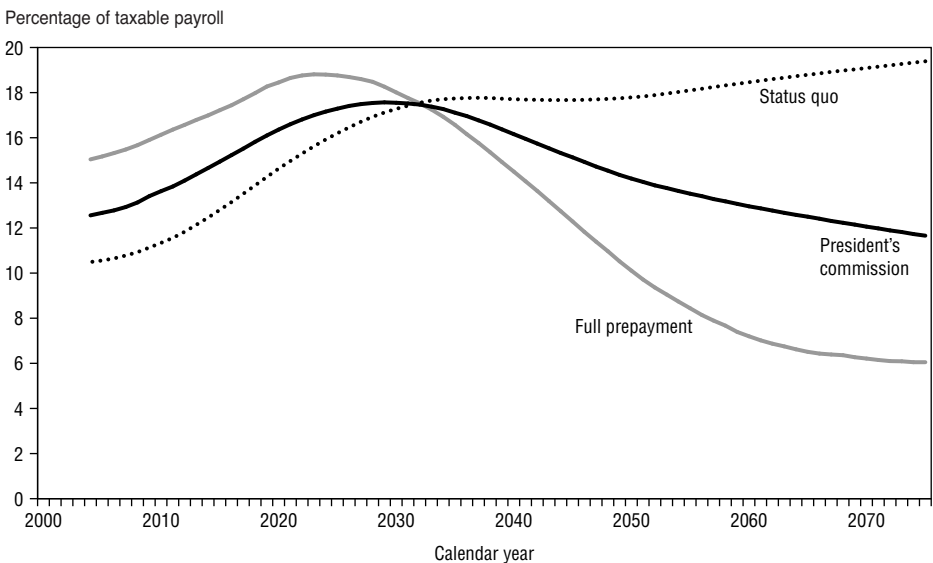
SOURCES: 2001 Social Security Trustees Reports and SSA 2001 Cohort Operations file, the President's
          Commission income and cost rates are based on the second plan from the 2001 report of
          the President's Commission to Strengthen Social Security, and the full prepayment income
          and cost rates are based on authors' estimates.

Table 4

Effects of Three Reforms on the Closed Group Obligation

Category	Surpluses Not Included	Reform I	Reform II President's Commission	Reform III
Present value of revenues	12.8	14.0	13.4	12.6
Present value of expenditures	25.8	25.8	22.0	18.5
Remaining closed group debt	−13.0	−11.8	−8.6	−5.9

SOURCES: Social Security Administration 2001 Cohort File and 2003 Trustees Report. None of the estimates include the Trust Fund offset as a revenue source.

gram that would have to be paid through taxes. In fact, the share of payroll going to program costs and private accounts is 6.05 percent in 2075 for **Reform III**, the second full prepayment reform, and 11.66 percent for the President's Commission reform, **Reform II**. Both reforms have total costs that exceed the status quo up to 2032 and then become increasingly better than the status quo.

Table 4 presents the effects of **Reform I**, the President's Commission reform, **Reform II**, and **Reform III** on the 100-year closed group obligation. The first two columns are from Table 3 and provide a reference point for the other two reforms. The commission proposal reduces the closed group net obligation by $4.4 trillion, about 34 percent, primarily by reducing benefits. Our assumption that all shortfalls are covered through payroll taxes results in a small increase in closed group revenues for the commission proposal of $0.6 trillion. Not surprisingly, **Reform III** has the greatest effect on the share of the closed-group debt paid by the closed group as it reduces the closed group debt by $7.1 trillion, or 54 percent.

In all three reforms, how the deficits are financed determines the degree to which they produce changes in the capital stock. For a reform to increase the capital stock, the implicit debt must be reduced. This means that reforms must be debt reducing to produce beneficial capital stock effects. Financing any reform with debt means that total debt remains unchanged and no capital stock effect occurs as individuals continue to use debt rather than capital to transfer resources across time.

The choice of the tax instrument used to pay the initial burdens of the reforms would also have economic ramifications. A broadly based tax, such as a consumption tax, does two things. It has a smaller deadweight loss than a payroll tax that raises the same revenues. It also spreads the burden of the tax to

retirees. This second point is important as we look at the timing of the additional burden of each reform. Given that the baby boomers have paid lower lifetime Social Security taxes than will be required of the next generation, in a generational equity sense it could be argued that the baby boomers should share in the cost of prepayment. This sharing of the cost could be accomplished by a transitional consumption tax during their retirement.

CONCLUSION

This paper provides an analysis of the benefits and costs of a transition from intergenerational transfer financing of elderly entitlements to intragenerational financing of these same entitlements. The benefit side of the equation is a result of the increase in the capital stock and income that, after the transition, translates into increased consumption for all future generations. The cost side reflects the necessary reduction in consumption for the younger generations during the transition period. We simulate three transitions to a prepaid system of elderly entitlements based on the current U.S. Social Security program.

As the simulations indicate, the more complete the reform, the higher are the initial costs and the higher are the long-run benefits in terms of the degree to which the payroll tax is reduced and the degree to which the capital stock increases. Ultimately, reforming how Social Security is financed is a political decision. Since the next generation has no voice in the decision, reforms with long-term benefits will be discounted in the voting process.

The estimates presented assume particular transitions to a private system of providing for elderly retirement benefits. There are other approaches, all of which can accomplish the goal of moving us from generation transfer-based Social Security to prepaid Social Security. Fundamentally, however, the financing issues addressed here must be faced whether or not any change is made in the basis of Social Security financing. Admittedly, the financing issue can be solved by providing those currently in the system with reduced benefits and increased taxes. Such a transition will leave the new members with a smaller debt and allow them to have more consumption than the transition discussed here. No matter how we make the transition, the elderly are going to consume real resources, and as the elderly population grows, the younger generations are going to have to give up consumption in favor of the elderly. The only real question is how these younger generations will be induced to give up the resources necessary to provide the elderly with their retirement benefits.

NOTES

[1] The current system is less progressive than it might seem from its highly redistributive benefit schedule due to a positive correlation between lifetime income and longevity. According to Gar-

rett (1995), differences in mortality considerably narrow, and in some cases eliminate, the progressive spread in returns across income classes. Liu and Rettenmaier (2003) also reached a similar conclusion by studying both the rate of return and the present value of the Social Security investment for different racial and education groups.

[2] For a detailed analysis of how individual accounts and intragenerational redistribution can be mutually compatible with progressive matching of individual accounts, see Kotlikoff, Smetters, and Walliser (1998).

[3] Current mortality tables imply that almost all of the existing population of 15-year-olds will be deceased by age 115. Thus, in 100 years, the closed group essentially contains no members.

[4] See 2003 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*.

[5] In this same letter, Jefferson went on to state, "On similar ground it may be proved that no society can make a perpetual constitution, or even a perpetual law. The earth belongs always to the living generation." All excepts are from *The Writings of Thomas Jefferson*, H. A. Washington, editor (1853–54, 392–97). Madison responded to this letter by noting that some investments on the part of the government, such as conducting a war, have far lasting benefits that may justify future generations' participation in paying for the investment.

[6] Many privatization proposals in the United States have adopted immediate tax increases as a way of financing the transition cost. As admitted in these proposals, however, it is often the case that the long-run benefits of a transition financed by sharp immediate tax increases come only at a cost to the initial working generations. Using a criterion of discounted present value, some studies have claimed an overall efficiency gain from this type of transition (see Feldstein 1995). Such a comparison between gains to one generation and costs to another generation, however, must resort to an across-generation welfare function.

[7] For example, see Geanakoplos, Mitchell, and Zeldes (1998), Mariger (1997), and Murphy and Welch (1998).

[8] For example, Feldstein and Samwick (1997) argue that the possible Pareto improvement from Social Security privatization comes from reduced capital market distortion. On the other hand, Kotlikoff (1998) identifies the main source of the efficiency gain from privatization to be the labor market distortion caused by payroll taxes.

[9] Therefore, any Pareto improvement that is the result of a transition from pay-as-you-go Social Security to prepaid retirement can be accomplished by a tax reform without any change in the generation transfer-based financing.

[10] In fact, prepayment does not generate any additional cost—at least not the kind of cost captured by this term—but serves only to bring the implicit government debts, in terms of accrued benefits in the pay-as-you-go system, to the surface.

[11] For a detailed discussion of the unfunded obligations in both Social Security and Medicare, see Liu, Rettenmaier, and Saving (2003). Note that the estimates in Table 2 are for 2002 rather than 2003.

[12] Given positive income growth, fixing the real defined benefit makes this reform a total prepayment reform in the limit as the ratio of prepaid benefit to defined benefit goes to zero.

[13] This contribution rate combined with a 5.4 percent rate of return would replace approximately 42 percent of an average worker's earnings. It has been argued that prepayment proposals should use lower rates of return either associated with a risk-free asset such as inflation-indexed bonds or on a financially engineered instrument that guarantees the pension return. This would be appropriate if scheduled Social Security payments were themselves guaranteed, but history shows that the Social Security "investment" changes over time in terms of the tax rate, taxable maximum, benefit formula, eligibility, and taxation of benefits. With a closed-group debt of $11.9 trillion, the program will be reformed in some way in the future. Thus, for a parallel comparison, the cost of a guarantee would have to be made explicit for both a prepaid program and the continuation of the status quo. Additionally, the existence of a risk-free rate is itself guaranteed by taxpayers.

[14] Admittedly there would be redistribution issues that would have to be addressed given that higher income workers' annuities would more than offset their scheduled benefits, but our purpose here is to merely illustrate the timing of the aggregate burden of a transition to fully prepaid accounts.

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