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***"Reforming Social Security:  
Issues and Challenges for Personal Retirement Accounts"***

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**Abstract**

We seek to analyze a number of important issues related to the ownership of government pensions. In the United States, Social Security is operated on a pay-as-you-go basis, with some limited pre-funding to prepare for the baby boom retirement. Moving toward more of a defined contribution system will require accounting for many details. Social Security will still need to find ways to cover its unfunded liabilities to past and present retirees, as well as to workers who have paid into the system. There are also many issues which will need to be clarified regarding the ownership of personal accounts: will participation be voluntary or mandatory, will annuitization be required, and how freely can participants choose their investment strategy. An assessment of personal accounts must also fully incorporate the role of disability benefits and survivor benefits. Finally, what will happen in the new system if the accounts do not achieve their expected returns? We use the example of the United States to highlight many important issues faced by countries looking to use defined-contribution pensions as a response to aging populations.

Key Words: Social Security Reform, Personal Retirement Accounts, Public Finance

Aging populations have pushed retirement pension reform issues into prominence in a number of countries throughout the world. One avenue of reform is to replace traditional defined-benefit systems with defined-contribution systems. This paper explores the debate over such reform in the United States in order to highlight a number of important issues concerning the efficacy of such reforms. Like many countries, the United States faces a situation in which the existing retirement pension programs will not be able to provide the full amounts of presently legislated benefits to future populations. This is because the aging population of baby boomers, coupled with longer life expectancies and declining fertility rates, will lead to an increasing dependency ratio. There will be more and more retirees for each working age person. President George W. Bush's plan for reform in the United States includes a large role for Personal Retirement Accounts (PRAs), a type of defined-contribution account. With PRAs, workers would obtain control over some portion of their payroll tax, investing this money for their own use during retirement, which moves the country closer to the President's goal of creating an "ownership society." This paper analyzes such an approach to reforming Social Security in the context of the United States, illustrating a number of issues that must be examined more carefully before making PRAs a viable reform for any country.

PRA advocates argue that such accounts allow workers to control their economic destiny because they "own" their retirement benefits. This is contrasted with the current Social Security system in which benefits can be reduced on the whims of Congress. We wish to explore this concept of ownership more deeply in the context of the many roles that Social Security plays in modern life. On the surface, people do not have a property right to Social Security benefits, while they would indeed own their PRAs. But this

paper argues that it is somewhat disingenuous to claim that PRAs will create a type of ownership that does not exist in the present system. The case is stated around four central points.

First, the problem with the existing system is that there are already large unfunded liabilities, because people in the past were paid much more benefits than what they contributed to the system through taxes. Social Security also has large unfunded liabilities for current workers and retirees who paid taxes into the system and are eligible for benefits. Any privatization of Social Security will still need to deal with how these promised benefits would be paid. As such, if one accounts for the unfunded liability that must be paid in the future if people are to receive the benefits they have been promised, then the creation of PRAs does not change much. People in the future will still need to pay higher taxes or receive lower benefits from the traditional Social Security system to maintain a balance in the system's finances.

A second problem with viewing PRAs as a true shift to ownership is that, by most accounts, there will still be many restrictions on PRAs. If so, people will not be completely free to make all of their own choices. If participation is mandatory, if people are forced to annuitize their assets at a particular age, and if people are limited to only a few possible investment options, then it is not clear how much ownership one could derive from a PRA as opposed to the traditional Social Security benefit. But increasing freedom regarding the treatment of PRAs will create adverse selection problems that could undermine the system, as well as lead many people to gamble away their future retirement pensions on risky or unwise equity bets.

The third issue regards the legal treatment of disability and survivor benefits when using PRAs. More work must be done to decide how PRAs will deal with the problems of disability and survivors. Social Security provides value as a social insurance system that responds to retirement, disability, and death. But too many advocates of personal accounts overlook the role of disability and survivor benefits.

Finally, the issue remains as for what can be done if PRAs do not produce as large of returns as their advocates expect. Advocates of personal accounts often cite the historically high returns associated with the stock market, relative to the perceived returns from a worker's Social Security taxes, as a sure-fire way of improving the fiscal picture for Social Security while simultaneously increasing benefit payments to retirees. However, the riskiness of the stock market means that even though returns could be higher on average, there is no promise of higher benefits for any given individual. PRAs will be subject to more volatility and risk. Unfortunately, the most comprehensive of existing analyses of Social Security reform with personal retirement accounts use the deterministic forecasts of the Social Security Administration, which show how the mean return could change but not show the associated variability of results. We include the results of a simulation to demonstrate some of these risks. How the system will respond if the stock market underperforms must be planned for in advance.

Ostensibly, PRAs provide a way to expand President Bush's "ownership society," but underlying issues will limit such accounts: the unfunded liabilities of Social Security must still be paid, restraints on individual behavior will likely be necessary, and the response to disability or death as well as the volatility of equity and bonds must be addressed.

## **2 Background of the United States Social Security System**

### **2.1 Brief History of Social Security in the United States**

Social Security is a program that encompasses approximately 98% of jobs and that currently provides benefits to one in six Americans. Recipients of Social Security benefits include not just retirees, but also disabled workers, spouses and young children of deceased or disabled workers, and the spouses of retirees. However, this was not always the case. In fact, the original Social Security Act of 1935 created retirement benefits for only the retired worker, who became eligible at age 65. In 1939, Congress passed amendments to extend benefits to spouses and minor children of retired workers, as well as to the widows and minor children of deceased workers. Disability insurance arrived in 1954, and in subsequent years, the disability program expanded to include the families of disabled workers. In 1972, Congress passed legislation to create annual cost-of-living adjustments for benefit levels. Prior to that time, benefit increases were subject to the whims of Congress and happened only intermittently.

The 1975 Social Security Trustee's report estimated that the Old-Age, Survivors, and Disability Insurance (OASDI) Trust Funds would be depleted by 1979. The program generally desires to have its Trust Fund not projected to run out (given all of the expected future tax collections less benefit payments) for at least 75 years, so leaders viewed this as a serious problem. In 1977, Congress enacted amendments to deal with the impending financial problems. The amendments increased the payroll tax, increased the amount of income that was eligible for the payroll tax, and reduced benefits slightly.

But because of the economic slowdown in the early 1980s, the Trust Fund again faced serious short-term funding problems. Alan Greenspan headed a commission to

examine this problem in 1983. The Greenspan Commission called for, and Congress subsequently passed into law, an increase in the normal retirement age to gradually extend from 65 to 67, increases in Social Security tax rates, and the addition of new taxes for the benefits of the wealthiest individuals. The goal was not only to solve the immediate financial problems, but also to build up a surplus over the next few decades in anticipation of the inevitable Trust Fund drain resulting from the coming baby boomer retirement. Under the current law, the combined employee/employer tax rate for OASDI is 12.4%, and the normal retirement age is beginning its slow ascent toward 67 for those born in 1960 and later.

## **2.2 The Outlook of Social Security in the United States**

That Social Security is expected to again undergo funding shortages at some point in the future should come as no surprise. Social Security in the United States is meant to be pay-as-you-go, meaning that each generation of current workers pays for the benefits of the current retirees. Three trends, though, will make this an increasingly difficult task despite the present surpluses. First, the baby boom cohort is of unprecedented size and will begin retiring in less than ten years. Second, life spans are becoming longer, meaning that the retiring baby boomers will enjoy longer retirements. The 2005 *Trustee's Report* indicates that when Social Security benefit payments began in 1940, the cohort life expectancy for men and women who reached the age of 65 were 12.7 and 14.7 years, respectively. Men and women retiring in 2000 share a normal retirement age of 65, but their projected cohort life expectancies have increased to 16.5 and 19.3 years, respectively. The SSA expects such trends to continue in the future, as men and women born in 2000 and who live to reach 65 in 2065 can be expected to live for another 20.4

and 23.0 years, respectively. The third important trend is the decrease in fertility rates. During the height of the baby boom, women, on average, were having between 3.5 and 4 children each during their lifetimes. Now these numbers are closer to 2, and the 2005 *Trustee's Report* expects the long-run fertility rate in the United States to be just 1.95.

Combining these three trends means that there will be fewer workers available to support the retirees in 10 to 30 years. The SSA predicts that the ratio of people aged 65 and older to those aged between 20 and 64 will increase from 0.208 in 2000 to 0.350 in 2030. In other words, the ratio of the working age population to the retirees is expected to fall from about 5:1 to 3:1. As indicated, a legacy of the 1983 Greenspan Commission is that the Trust Fund accumulates more each year than it spends in order to build a buffer. However, in the 2005 *Trustee's Report*, the best guess for the future is that while the OASDI Trust Fund will continue to run surpluses until 2017, it is projected to run out of money by 2041 so that subsequent years will be met with drastic cuts in benefits, increases in taxes, or borrowing from the rest of the government's budget. In 2041, the tax revenue that arrives would be enough to pay 74% of legislated benefits once the Trust Fund is depleted. The Trustees find that an immediate increase in the payroll tax of 1.92 percentage points, or an immediate across the board reduction in Social Security benefits of 13%, or some combination of the two, would restore actuarial balance to Social Security over the 75 year horizon. Nevertheless, the changes would need to be even more severe to provide stability over an even longer time horizon.

### **2.3 Legal Treatment of Social Security Benefits**

As indicated before, there have been instances in American history when Congress legislated a reduction in Social Security benefits. One might question whether

this is legal by arguing that the payment of Social Security taxes creates a legal right to obtain the legislated benefits. If such an arrangement constitutes a contract, then Congress has no legal authority to reduce benefits. The U.S. Supreme Court examined this situation in the 1960 case of *Flemming v. Nestor*. Nestor had been receiving Social Security benefits at the time he was deported from the United States for his previous membership in the Communist Party. His Social Security benefits receipt ended with his deportation, and he sued with the argument that he had a “property right” to continue receiving benefits. The Court concluded that no contract exists to guarantee a particular level of benefits, and Congress has the authority to modify benefit payments in reasonable ways in order to adjust to changing conditions (Swendiman and Nicola, 2005).

This conclusion is used by advocates of personal retirement accounts to justify eliminating the traditional system. For example, the Cato Institute wrote about this issue in 1999 by stating:

With fully private personal retirement accounts, workers would have a property right in their retirement savings. They would own their accounts and the money in them, the same way people own the money in their savings accounts. That property right would protect workers’ savings from politicians looking to pinch pennies in a debt-riddled system. Workers deserve the security of owning their retirement savings.

In this view, the importance of PRAs would be to give people control of their own economic destiny by ensuring they have a legal right to obtain retirement benefits. This is the context in which personal retirement accounts have been proposed.

#### **2.4 President Bush’s Path for Reform: Personal Retirement Accounts**

The President’s Commission to Strengthen Social Security (2001) report offers three different sets of reforms, all of which include some form of voluntary personal accounts. The first reform proposal (Plan 1) is not intended to restore actuarial balance.

It creates voluntary personal retirement accounts for up to 2% of a worker's taxable payroll. The remainder of the payroll tax (10.4% under the presently legislated payroll tax of 12.4%) enters into the traditional Social Security system. Upon retirement, a beneficiary may annuitize the personal retirement account.

Traditional Social Security benefits will be offset by an amount that depends on the levels contributed to the PRA. Any funds entered into the PRA will also be entered into a hypothetical calculation in which the funds grow at an "offset yield rate" that, in the case of Plan 1, averages 3.5% plus the rate of inflation. Policymakers would decide whether to use the fixed 3.5% rate, or to calculate the number as 0.5% above the realized or expected annual market yield on long-term Treasury bonds (forecasted to be 3.0%). Between these choices, the use of a fixed 3.5% would make the net benefits for a worker more sensitive to variations in the actual return on the Treasury bonds, because when bonds do poorly, the benefit offset would not change while the return to the investment portfolio will probably be smaller.

At the normal age of retirement, the hypothetical sum for the PRA and the actual value of the PRA will be entered into an annuitization calculation. Goss and Wade (2002) argue that the most likely case would be to use a fixed real annuity based on unisex mortality tables, and that married couples would have the annuity calculated as a joint and  $2/3$  survivor life annuity. Retirees receive the annuity associated with their own PRA while the portion of their benefit from traditional Social Security would be offset by the hypothetical annuity amount. In other words, workers can expect to receive a higher total Social Security benefit if their PRA portfolio grows at a real rate that is higher than 3.5%. Gustman and Steinmeier (2002) argue that workers will participate if they are

sufficiently confident that they can develop an investment strategy which will garner a higher real rate of return than the benefit offset rate.

This Plan 1 proposal is expected to push the Trust Fund further out of actuarial balance, though the details of this contention are understandably a bit controversial. According to Goss and Wade (2002), under this plan the 75 year actuarial balance will be pushed from -1.86 to -2.34, meaning that an increase in the payroll tax of 2.34 percentage points, instead of the 1.86 percentage points thought at the time, would be needed to keep the Trust Fund in balance. However, advocates of the plan rightly point out that in some sense this is arbitrary, because the plan works by having the traditional Social Security Trust Fund receive less taxes in the short-term, whereas the associated decreases in benefits arise more in the long-term after the people with personal retirement accounts retire. As such, some advocates of the plan argue that it should be considered as having no net effect on the actuarial balance. Actually, the reverse subsidy of the offset rate should slightly help the fund as Social Security will be able to discount benefits at the offset rate of 3.5% while having been expected to earn only 3% in real terms had it held these assets itself. This point is made by Diamond and Orszag (2002). However, this is where the issue of transition costs arise, and questions remain about how financial markets would view increased government borrowing in the short-run, even if one was sure that the borrowing could be easily paid back in the long run.

The second reform (Plan 2) offered by the President's Commission includes a number of attributes in addition to the PRAs, and it is expected to lead to actuarial balance. First, the PRA allows up to 4% of a worker's taxable payroll, or up to \$1,000 indexed for wage growth, whichever is lower. In present dollars, this means that workers

earning more than \$50,000 per year will be limited to contributing less than 2% of their taxable income to the PRA. The other portion of the traditional payroll tax (at least 8.4%) would go to the traditional Social Security Trust Fund. This proposal also includes the benefit offsets using the hypothetical annuity method described before, though now the benefit offset rate is 2% plus inflation. This lower offset rate means that Social Security will be subsidizing the owners of PRAs, as the assets would have earned a 3% return in the Trust Fund. The payroll tax would also need to be increased by about 0.63 percentage points to maintain actuarial balance, though the Commission supports transferring revenues from the government's general budget instead of implementing a payroll tax increase.

The method employed in Plan 2 to obtain Trust Fund balance is to have traditional benefits be price indexed rather than wage indexed. This is the "price indexing" proposal, which is distinct from the current system of wage indexing. It will lead to large reductions in the growth of benefits separate from the benefit offsets. For young workers, payroll taxes would continue growing in real terms while benefits stay at the same real level. The impact of this reform grows over time, and Pfau (2006) shows that after 60 years, price indexing will reduce the total incomes of the poorest elderly by up to 50 percent. Plan 2 would create sustainability for the Social Security Trust Fund by substantially reducing the growth rate of future benefits from traditional Social Security under the assumption that workers would make up the difference with their personal accounts. This would be implemented starting in 2009 by multiplying the bendpoint factor ratios of the Primary Insurance Amount formula by the ratio of the price index to the wage index (approximately 0.99 on average) from two years prior. Other features of

the proposal include for the minimum benefit level of a 30 year worker to be at least 120% of the poverty level, and for widows to receive 75% of the total couples' benefit instead of the present two-thirds.

The third reform (Plan 3) adds additional complications. The personal retirement account would consist of 2.5% of the taxable payroll up to the wage indexed \$1,000 level, with the requirement that the worker contributes an additional 1% of their income to the PRA. Traditional benefits would be offset using the same hypothetical calculation with an offset rate of 2.5% plus inflation. The 1% additional income would be partially subsidized in a progressive manner by a refundable tax credit. The minimum benefit for 30 years of work would be 100% of the poverty level, and 111% would be offered for 40 years of work. Initial benefit growth rates would be adjusted for future changes in life expectancy, which would translate into average benefit indexing rates of 0.5% above inflation. Widows would also receive 75% of the total couple's benefit. Finally, the final bend factor of the PIA formula would be flattened from 15% to 10%, which would reduce benefits for wealthier workers.

### **3 Personal Retirement Accounts and the Ownership of Benefits**

If the goal is to make meaningful comparisons between PRAs and the current Social Security system, then it is vital that the proposals be put on an equal footing. This means that the unfunded liabilities of the present system must be considered for a proposal that transitions to PRAs. It also means that we must consider the nature of ownership as it applies to PRAs. How free will people be to make decisions about their accounts? It also means that we need to consider how PRAs would function if the owner becomes disabled or dies. This is related to the need for evaluating the full value of

existing Social Security benefits. Finally, it is important to consider the potential returns to PRAs, and to think about what would be done if PRAs fail to meet their expected returns on a large-scale basis.

### **3.1 Social Security's Unfunded Liability**

Because Social Security began as a pay-as-you-go system whose earliest beneficiaries received generous retirement benefits after contributing very little to the program, part of Social Security taxes must be viewed as necessary payments on past debt for early retiree payments, and not as personal investments. In fact, the 2005 *Trustee's Report* indicates that the present value of future costs less future taxes for past and current participants over the infinite horizon is \$13.7 trillion. Meanwhile, the Trust Fund only holds \$1.7 trillion. After accounting for the fact that future generations are already expected to pay more into the system than they will receive, this leaves a current unfunded liability of \$11.1 trillion.

If these debts are ignored, then the current retirees and people about to retire will be the ones to lose out on their promised benefits, having already paid for earlier beneficiaries without having anyone left to pay for their own benefits. Any fair comparison of reforms will need to account for this. This precludes a complete switch to PRAs, because the Trust Fund would quickly empty out. Any PRA plan will put additional pressures on traditional Social Security by diverting some of its revenues, and this needs to be accounted for when discussing reform.

### **3.2 Personal Retirement Accounts and the Freedom to Make Decisions**

Will participation in PRAs be voluntary or mandatory? Will participants be required to buy an annuity, or can they take lump-sum payments from their PRA savings

or leave their PRA savings as a bequest? How much freedom will a person have to choose their investment portfolio? These three issues need to be resolved on account of the tradeoff between allowing greater freedom, and thus a greater degree of ownership, and having a more efficient pension system.

On the first point, the President's Commission insists that participation will be voluntary. However, this is problematic, because without 100% participation the problems of adverse selection would almost certainly make the assumption of actuarially fair annuities based on the United States population impossible to maintain. Second, the President's Commission also suggests that there will be flexibility in the decision of whether or not one annuitizes their PRA holdings upon retirement, as long as the resulting benefits would place them above the poverty level. The President's Commission also suggests that those facing low survival probabilities at retirement (such as the terminally ill) may be allowed to opt out of annuitizing their assets. But this would create further adverse selection problems that could undermine the value of annuities paid to those who actually decide to participate.

It is worth considering some of the equity implications for whether the PRAs are mandatory or voluntary. First, if they are voluntary, then since higher income individuals earn lower rates of return under the present system, they could be expected to have higher participation rates. Removing these workers from traditional Social Security would weaken the ability of Social Security to redistribute wealth to lower-income workers, and would also leave lower-income workers with more of the responsibility for funding the liabilities of Social Security. Also, because higher-income workers generally experience longer life spans, those lower-income individuals who participate could see their annuity

levels drop if the annuity providers consider life tables for the actual PRA participants instead of the population at-large. At the same time, since lower income individuals generally have higher mortality rates anyway, they may be less interested in the annuities provided by the PRAs, even if such annuities are calculated using life tables for the aggregate population. This is because unlike with the annuity provided by Social Security, PRA owners may desire to leave the PRA assets to their descendants. Differential participation could also develop along gender lines, as men could be less apt to annuitize given that the value of their annuities will be pulled downward by the longer life spans of women. There would also be a problem with forcing people to annuitize during a bearish stock market. It may be the case that people delay their retirements beyond a comfortable age in order to wait for the stock market to return to more acceptable levels.

The third important issue regards the amount of flexibility that will be provided to participants in choosing the contents of their investment portfolios. The President's Commission (2001) and Goss and Wade (2002) both assume a personal account portfolio vested 50% in equities, 30% in corporate bonds, and 20% in US Treasury long-term bonds. This is a way to gain broad diversification, and it is necessary to improve the probabilities of achieving the account returns expected for PRA owners. Equities are assumed to have a long-term average real yield of 6.5%, while corporate bonds and Treasury bonds have expected real returns of 3.5% and 3.0%, respectively.

Administrative costs are assumed to be 0.3% of the annual balance. The average real yield for such a portfolio is 4.6%. Goss and Wade (2002) follow the methodology of the *Trustee's Report* by creating three alternative assumptions for this portfolio. In the

pessimistic case, the combined return of this portfolio less administrative expenses drops to 2.7%, and in the optimistic case the returns less expenses are 6.8%.

There are important implications regarding the provision of freedom in making account allocation decisions. A gambler or risk-seeker could easily lose their entire account with a few unfortunate equity investments. Meanwhile, those who wish to play it safe could choose a portfolio of bonds whose returns fail to beat the benefit offset rate, which is important if accounts are to provide larger returns than the traditional Social Security system. For these reasons, it is expected that PRA holders will face a limited selection of investment options that include broad index funds of various kinds.

### **3.3 Personal Retirement Accounts After Disability or Death**

An important issue which is often overlooked in the debate about PRAs regards what will happen to the PRA when a worker becomes disabled or dies. This issue plagues a number of studies that have provided support for PRAs. For instance, Feldstein and Ranguelova (2001) create a stochastic analysis for the equity returns of private accounts invested into stocks and bonds. They conclude that a PRA with only 6% of payroll invested 60% in equities and 40% in bonds has only a 17% probability of returning annuities smaller than the presently legislated benefits available from a 12.4% payroll tax. However, by only considering the retirement aspect of Social Security, the paper does an inadequate job of accounting for disability and survival benefits. Risks of pre-retirement death and disability mean that the Feldstein and Ranguelova analysis undervalues existing Social Security benefits.

Feldstein and Liebman (2000), on the other hand, provide a more thorough analysis of private accounts and find that virtually all demographic groups they examine

achieve higher average benefits with a partial private account than they would receive under existing Social Security rules. However, this study has *ex ante* stacked the cards too much in favor of personal accounts. Feldstein and Liebman's results are a foregone conclusion because the entire contents of a worker's private account are added to the worker's benefit level, even in cases where the worker does not have any family members to bequeath the account to after an untimely pre-retirement death. The study also ignores the current system's disability benefits and benefits to children, which effectively denies the ability of the present system to "compete" with private accounts in providing wealth to loved ones.

These problems also plague the analysis of policymakers. How PRAs would be distributed in the event of disability or survivorship is uncertain, as is clear in reading the President's Commission report. Commission members Cogan and Mitchell (2002) argued in a separate paper that with regard to disability and survivor benefits, the contents of the personal retirement account are not accessible until the worker or surviving spouse reaches their retirement age. The alternative would be to allow PRAs to be accessed at younger ages with an offset for traditional benefits, but these resulting annuities could be quite small. This means that with Plan 1, any benefits distributed before the normal retirement age for survivorship (or disability) will be calculated the same way as in present law, and at the time of the normal retirement age there is an adjustment in benefits made for the PRA annuity and offset. However, for Plan 2 this means that pre-retirement benefits may be much lower than presently legislated on account of the price indexing aspect of the reform proposals. At the age of retirement,

both plans are likely to provide smaller annuities as a result of the deceased or disabled worker having experienced a shorter working career.

Advocates of PRAs argue that they provide their users with a method for passing wealth to relatives. But these advocates ignore the role of disability and survivor benefits in passing wealth on to relatives. Thus, they overlook a key part of the existing system. The primary function of the PRAs is not to create an inheritance, but rather to allow investment in equities and bonds that could potentially increase the rates of return from Social Security. Thus, when analyzing PRAs, it is more reasonable to assume that single males and single females do not have anyone to pass their PRA on to in the event of an untimely death. This assumption runs counter to the Feldstein and Liebman (2000) assumption that the PRA would be bequeathed to “someone else.” Of course, if the PRA assets of a young deceased single worker are counted as part of his/her lifetime benefits, this will drastically increase their rate of return and lifetime transfers of PRAs, even though the recipient of such a bequest would be so far removed from the worker.

### **3.4 The Return to Personal Retirement Accounts**

The debate whether the United States should adopt personal retirement accounts as a part of Social Security reform has, in many ways, taken place assuming a best case scenario for the accounts. There are many uncertainties regarding the benefit a worker may eventually receive from their personal account. The returns to be obtained from personal retirement accounts are quite sensitive to the assumptions made about investment portfolio composition, the performance of financial markets, the size of administrative costs, the nature of the annuitization process, and the treatment of account bequests upon death. The price of annuities depends on the expected remaining lifespan

of the annuitant and whether the life tables used are for the population at-large or are more individual specific, the possibility of adverse selection in the annuity purchasing population, the profit requirements of the annuity providers, and the interest rate that the annuitant expects to be able to earn on the reserves of the annuitized PRA. Many scenarios could unfold to create situations with low PRA benefit levels for some retirees.

A few studies exist which simulate personal accounts using past data. For example, Burtless (2000) examines the historical record by allowing the proposed system of personal retirement accounts to have applied to each cohort retiring from 1911 to 1999, in order to examine the extent of financial risk imposed by a shift to personal accounts. Burtless ultimately opposes personal retirement account proposals because of their allocation of risk exclusively to individual workers rather than sharing risk over time and across the population. The paper finds that a 40 year working career does not provide confidence that the return from a private account can match the historical average return. Workers retiring several years apart could generate quite divergent annuity amounts, and the higher the portion of the personal account dedicated to equities, the greater the variability in outcomes. For instance, a worker depositing six percent of income into a personal account invested in equities created pensions through the historical period ranging from less than 20% of peak career earnings to more than 100% of peak earnings. More conservative investment portfolios occasionally lead to even smaller returns at the lower end, and the ultimate conclusion of the paper is that personal retirement accounts would create too much risk that pensions would not be adequate to finance a comfortable retirement.

More recently, Shiller (2005) studies this issue using a wider variety of possible investment patterns, including life-cycle investing. He finds that with a life-cycle investment portfolio, accounts would only beat a 3% real offset in 68% of the historical cases, and the median real rate of return from the PRA is 3.4%. But if one accounts for the lower worldwide return on equities, then the personal account would only beat the 3% offset in 29% of cases.

These studies do not completely account for the risk of the stock market, since they only use historical data. But whereas they at least make an effort to account for the effects of fluctuating returns, the President's Commission ignores the risk of investing in the stock market by assuming that the stock market will produce a constant real (after inflation) return of 6.5 percent each year into the future. Meanwhile, as indicated, they assume corporate bonds will provide exact real returns of 3.5 percent, and Treasury bonds will offer a 3 percent real return. They also assume that the administrative costs for maintaining these accounts will be 0.3 percent each year. Then, in their baseline case for personal accounts, they assume workers will hold an investment portfolio consisting of 50% stocks, 30% corporate bonds, and 20% long-term Treasury bonds. After deducting administrative costs, they assume this portfolio will provide a constant annual real return of 4.6 percent for each year in the future.

This is problematic because financial markets do not provide such a constant return each year. While the stock market may yield higher returns on average, it does this by forcing investors to accept greater risks of large year-to-year fluctuations. Thus, there is no guarantee of higher benefits for any particular individual. The President's

Commission always shows workers getting higher returns with personal retirement accounts because a 4.6 real return always beats the benefit offset rate.

In an attempt to better account for this risk, we generate 10,000 computer simulations of portfolio returns which maintain the same long-run assumptions as the President's Commission, but incorporate fluctuations over time that are driven by the

**Table 1: Stochastic Returns from Personal Retirement Accounts with Different Assumptions:  
The Probability of the PRA Return Beating the Benefit Offset Rate**

|   | <b>Prob &lt;<br/>0%</b> | <b>Prob &gt;<br/>2%</b> | <b>Prob &gt;<br/>3.5%</b> | <b>Prob &gt;<br/>5%</b> |
|---|-------------------------|-------------------------|---------------------------|-------------------------|
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 0.3%<br>Overhead Costs: 0%  | 0.8%                    | 91.0%                   | 68.0%                     | 33.0%                   |
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 5%<br>Administrative Costs: 0.3%<br>Overhead Costs: 0%    | 2.3%                    | 81.0%                   | 50.2%                     | 19.0%                   |
| Portfolio: 20% stocks, 80% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 0.3%<br>Overhead Costs: 0%  | 0.0%                    | 94.0%                   | 53.0%                     | 8.0%                    |
| Portfolio: 0% stocks, 100% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 0.3%<br>Overhead Costs: 0%  | 0.0%                    | 80.0%                   | 32.0%                     | 4.0%                    |
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 1%<br>Overhead Costs: 0%    | 2.3%                    | 82.2%                   | 51.3%                     | 19.9%                   |
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 0.3%<br>Overhead Costs: 15% | 2.6%                    | 81.2%                   | 52.0%                     | 20.7%                   |
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 6.5%<br>Administrative Costs: 1%<br>Overhead Costs: 15%   | 5.5%                    | 68.2%                   | 34.3%                     | 10.1%                   |
| Portfolio: 50% stocks, 50% bonds<br>Real long-run average return on stocks: 5%<br>Administrative Costs: 1%<br>Overhead Costs: 15%     | 12.7%                   | 52.5%                   | 22.2%                     | 4.8%                    |

Source: author's calculations

variation in stock and bond market returns that we have observed since 1950. This way, workers will occasionally enjoy extraordinarily high returns for their accounts, but also risk ending up with negative returns. The results are displayed in Table 1.

In many ways, we still have the best case scenario for personal accounts, but we can begin to see how personal accounts are not infallible. The probability of earning a higher rate of return than the benefit offset rate for Plan 2 (2%) is about 91 percent. Thus, in 9 percent of these simulations, workers end up with lower benefits by adopting an account even before considering the additional cuts from the price indexing of traditional benefits. The corresponding number for Plan 1 (3.5%) is 68 percent. Thus, in 32 percent of cases, under the best scenario example, workers should not expect to beat the benefit offset rate.

Now consider what may happen if the future is not as rosy as the President's Commission expects. First, can the stock market really even provide an average real return of 6.5 percent? There are several reasons to question whether individuals could expect to earn the historical averages for stocks and bonds. Even if the market produces these returns, there is a question whether individuals would be able to take advantage of it. To do so, they must follow the advice of buying a diverse portfolio that tracks major stock and bond indices and keeps low administrative costs. Second, there is doubt whether the stock market will be able to continue producing such high returns in the future. The Social Security Administration assumes a future GDP growth rate of 1.8 percent, which is not compatible with such high stock returns. And, if the economy grows fast enough to produce these stock returns, then much of Social Security's funding problems will be solved by economic growth. If we adjust the average future real return

to the stock market from 6.5 percent to 5 percent, then there is an 81 percent chance for private accounts to produce a larger return than the benefit offset rate in Plan 2.

In addition, while the baseline case assumes that the investment portfolio is held half in stocks and half in bonds, the Commission also suggests that those who are afraid of risk can choose to hold more bonds in their personal accounts. Unfortunately, holding more bonds makes it more difficult to beat the benefit offset rate. Just like stocks, bonds do not produce a constant return each year. Even though bonds pay a fixed rate each period, their real returns fluctuate with changing inflation and market interest rates, just not to the same extent as stocks. If someone decides to hold only corporate and government bonds in their portfolio, the chance of beating the 2 percent benefit offset rate falls to about 80 percent.

The President's Commission's assumption of 0.3% administrative costs is also on the optimistic side. The assumption might be reasonable, but only if workers are required to choose from a small number of passively managed index funds. Reasons to expect higher costs include that many personal retirement accounts will be quite small and thus harder for financial institutions to manage at such a low percentage. Also, if workers wish to choose actively managed funds, then the costs will be higher. Costs would be higher because the government would take responsibility to educate the public about investment strategies such as diversification, risk, and optimal portfolio allocation. Baker (1998) believes that administrative costs could be as high as 1 to 2 percent annually. Returning to the baseline portfolio, if administrative costs were raised to one percent each year, then the probability of developing a portfolio that beats the 2 percent benefit offset rate falls to 82 percent.

Buying annuities is also not the free lunch that the Commission suggests. The President's Commission assumes that retirees will be able to purchase an actuarially fair annuity at the time of retirement and not have to pay any overhead or administrative costs. But according to the way that annuity markets currently operate, it would be seemingly impossible. Annuity providers are constrained because they need to cover their costs of business. Also, if personal accounts are voluntary, there will be adverse selection. People who expect to live shorter lives will decide not to buy an annuity. This leaves a remaining population of annuitants who will live longer, on average, than the United States population considered as a whole. Companies that sell annuities will have to account for the longer lives of these people and therefore offer them a smaller annuity payment each year.

In total, researchers such as Walliser (1998) have pointed out that these costs add up to somewhere around 15 – 25 percent of the amount of money one has accumulated at the time of purchasing an annuity. If overhead costs were 15 percent, then the probability of having a higher real return than 2 percent falls to 81 percent. Meanwhile, if we combine administrative costs of 1 percent a year along with an overhead cost of 15 percent, then the probability of developing a portfolio that beats the 2 percent benefit offset rate falls to 68 percent. If we further add in the assumption that stocks will have a 5 percent real return on average, then the probability of beating the benefit offset rate in Plan 2 is only 52.5%. Those are not necessarily bets that people would be willing to take with their retirement incomes, especially as price indexing is also decreasing the value of the traditional portion of the benefit.

Personal accounts are, without a doubt, supposed to provide workers with much higher benefits, so that they can still earn more for retirement despite the huge reductions created by price indexing. But the chances of personal accounts producing as high of returns as the President's Commission assumes are very suspect. The "ownership" of Social Security in this case transfers the ownership of many risks from the government to workers, and how society will respond to keep the elderly out of poverty must be considered.

#### **4 Conclusion**

Aging populations are affecting many countries. In some countries, such as Japan, Italy, or Germany, the situation is already much worse than that in the United States. On the other hand, many transitioning economies have young populations and are still in the process of determining the nature of their pension systems. The lesson to be learned is that pay-as-you-go pension systems are not necessarily ideal in countries with aging populations, especially if they are overly generous to their early recipients. Some may view a switch to PRAs as a solution for the aging world, but such analysis is oversimplified if it does not account for the unfunded liabilities of the existing pension system, or if it does not properly value the benefits (including survivor and disability benefits) of the existing system, or if it does not take care in incorporating the increased risks created by equity investments. A selling point of PRAs in the United States is that they will create an ownership stake that puts people in control of their economic destiny. Upon closer inspection, it is not clear how meaningful such promises of an ownership stake will be.

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