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Social security and retirement savings accounts

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Abstract

The turmoil in financial markets has brought increased attention to the use of defined contribution and 401(k) plans. Many believe that the benefits of 401(k)s are disproportionately available to the wealthy and that 401(k)s do little to help lower income workers prepare for retirement. This paper offers a proposal tying such accounts into Social Security reform. Our proposal generates increased retirement security for workers without imposing new taxes, has little or no transition costs, does not reduce revenues currently flowing to the U.S. Treasury, but does generate nontrivial reductions in Social Security costs. © 2010 Academy of Financial Services. All rights reserved.

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1. Introduction

Defined contribution (DC) plans continue to be preferred over defined benefit (DB) plans, especially by smaller employers. Hewitt Associates surveyed employers offering pension plans and found that 93% of the respondents offered a DC plan, while only 48% offer an ongoing DB plan (Hewitt, 2008). One important reason for this disparity is that defined contribution plans shift the risk of underperformance in investments to the employee. However, concern abounds as to whether or not employees have the ability to successfully manage their retirement portfolios. For example, far too many participants in 401(k)s

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(~47%) place 100% of their 401(k) money into money market type investments, while ~22% allocate 100% to equity (Nofsinger, 2008).

Traditional 401(k)s provide an immediate tax benefit in that employee contributions are excluded from taxable income and employer contributions are tax deductible to the employer. The accounts grow on a tax-deferred basis while withdrawals are taxed as income in the year of withdrawal. Contributions to Roth 401(k)s are made with after-tax dollars, and thus do not diminish immediate tax revenue to the government. Growth in the value of the Roth accounts as well as disbursements that meet established rules are not taxed, thus imposing a reduction in future tax revenue to the government, ceteris paribus. Some members of Congress find it difficult to justify this foregone tax revenue (tax expenditure) of 401(k)s and Roth 401(k)s without the social benefit of an increase in the U.S. savings rate and/or widespread participation in 401(k) plans, specifically including lower income workers participating in 401(k)s. Rep. George Miller, D, California, commented in Congressional hearings held in October of 2008 that, "We've [that is, the government] invested $80 billion into subsidizing this activity [401(k)s] ... [that] are not generating what ... they should." (http://www.investmentnews.com/apps/pbcs.dll/article?AID=/20081012/REG/310139971)

However, the social benefits of retirement policies can also be measured from the perspective of the general good, and not merely by looking at the specific benefits that might indeed disproportionately accrue to wealthier workers from 401(k) plans. In particular, we have in mind the general social benefit of reducing the financial burden that payment of Social Security benefits are soon to place on the U.S. government. Within a few years, sometime between 2017 and 2019, the payroll taxes that U.S. workers pay in support of Social Security programs will no longer be sufficient to meet the demands placed on the Social Security system by the retirement of the "baby boom" generation born between 1946 and 1964. In about 30 years' time, around 2037, the Social Security system will have exhausted the Old Age, Survivors, and Disability trust fund (OASDI) that has been built up in recent years. Many reform proposals have been proposed to address these expectations, ranging from privatization of Social Security to funding the system from general revenue. President Clinton noted some years ago that there are only three options that matter (Tanner, 2004):

1. Cut benefits,
2. Invest Social Security taxes to earn market rates of return, or
3. Raise taxes.

This paper adds a twist to the "cut benefits" option that makes the concept economically and politically feasible. We craft a mechanism that replaces the existing 401(k) accounts with a new program of tax-deferred savings. As does Ghilarducci (2007), we substitute tax credits for participants in our plan for the tax expenditures of 401(k)s. For lower income workers, these tax credits make the effective out-of-pocket cost almost zero. For younger workers of all income levels the benefits of the plan are clear, as we demonstrate in our results (Table 1). Workers in the middle years of their working lives also benefit (Table 2). However, older workers see no improvement or only minor improvement under this proposal (Table 3). The greatest payoff from our proposal is that for a sufficient lead time (~20 years), the plan results in the elimination or near elimination of the pending Social Security funding shortfall.

Given recent market conditions, there is apprehension among many as to the wisdom of

Table 1 Panel a 22 years of age in 2008, 45 working years at 50% of median net compensation, income tax rate of 20%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$3,745	$ 315	$ 63	6.73%	$ 86	4.33%	1.68%
3%	$3,745	$ 555	$111	11.85%	$134	7.99%	2.96%
5.7%	$3,745	$1,021	$204	21.81%	$213	15.25%	5.45%
10%	$3,745	$3,163	$633	67.58%	$500	47.85%	16.90%

Panel b 22 years of age in 2008, Forty-five working years at median net compensation, income tax rate of 28%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$5,221	$ 630	$ 176	8.69%	$ 401	0.94%	3.38%
3%	$5,221	$1,110	$ 311	15.30%	$ 595	3.50%	5.95%
5.7%	$5,221	$2,042	$ 572	28.16%	$ 896	9.38%	10.95%
10%	$5,221	$6,327	$1,772	87.25%	$1,891	37.46%	33.93%

Continued

investing in security markets (Spitzer, 2009). We disagree with those who counsel abandonment of the markets. Securities markets remain the most attractive investment option for investors with long term horizons such as those for retirement planning. Our plan alleviates the concern that securities markets underperform, at least to some degree, by making the determination of the impact of our plan on Social Security benefits to be after the fact. That is, the magnitude of a participant's reduction in Social Security benefits is conditional on the investment results the individual actually experiences leading up to retirement. In a nutshell, if one experiences poor investment results, their benefits are reduced only a little or perhaps not at all. If markets experience investment performance more in line with the historical record, Social Security benefits are reduced but the benefits from the savings account outweigh (and far outweigh for younger workers) the reduction in Social Security benefits. Our proposal creates reductions in Social Security benefits ranging from zero percentage, if

Table 1
(Continued)

Panel c 22 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 5% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$6,394	$ 907	$ 363	8.51%	$ 678	−1.89%	5.67%
3%	$6,394	$1,448	$ 579	13.59%	$ 869	0.00%	9.06%
5.7%	$6,394	$2,418	$ 967	22.69%	$1,118	4.43%	**15.13%**
10%	$6,394	$6,469	$2,587	60.70%	$1,775	25.78%	40.47%

Panel d 22 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 10% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$11,541	$ 2,729	$1,092	14.19%	$2,500	−6.14%	9.46%
3%	$11,541	$ 3,738	$1,495	19.44%	$2,950	−4.88%	12.96%
5.7%	$11,541	$ 5,324	$2,130	27.68%	$3,490	−1.97%	18.45%
10%	$11,541	$11,033	$4,413	57.36%	$4,765	11.38%	38.24%

security markets perform poorly, to 20% or more if markets perform well. By eliminating the current 401(k) plans and substituting our plan, the net revenue impact on the Federal government, compared to existing programs, is nil, in a manner similar to that proposed in Ghilarducci's (2007) plan to replace 401(k)s with guaranteed retirement accounts (GRAs). Thus, our proposal dramatically reduces and possibly eliminates the Social Security underfunding problem, significantly enhances the retirement income of U.S. workers, without any net loss in current revenue to the Treasury, without raising taxes, without significant transition costs, and without giving politicians more money to spend. Mandatory participation, but little to no out-of-pocket cost of lower income workers, combined with determi-

Table 2 Panel a 34 years of age in 2008, 45 working years at 50% of median net compensation, income tax rate of 20%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$1,612	$186	$ 37	9.22%	$ 51	5.89%	2.30%
3%	$1,612	$275	$ 55	13.63%	$ 69	8.97%	3.41%
5.7%	$1,612	$411	$ 82	20.41%	$ 94	13.77%	5.10%
10%	$1,612	$852	$170	42.26%	$164	29.14%	10.56%

Panel b 34 years of age in 2008, 45 working years at median net compensation, income tax rate of 28%, 6.255% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$2,718	$ 372	$104	9.84%	$236	1.05%	3.83%
3%	$2,718	$ 550	$154	14.56%	$312	2.78%	5.66%
5.7%	$2,718	$ 823	$230	21.80%	$410	5.82%	8.48%
10%	$2,718	$1,704	$477	45.13%	$668	16.50%	17.55%

Continued

nation of the plan's impact on benefits ex-post realized investment performance overcomes the reluctance of workers to accept financial risk in their retirement accounts (Schwabish and Topoleski, 2009).

We proceed by presenting a review of the literature relating to retirement planning and Social Security reform in the next section. We start with the important recent contributions of Teresa Ghilarducci (2007). We next establish the clear trend away from defined benefit plans and towards defined contribution plans. We establish the reality of the looming Social Security crisis. In regards Social Security reform, we contrast the pay-as-you-go (PAYGO) approach to Social Security adopted by the U.S. government with funded approaches to pensions. The discussion identifies within current research which groups favor PAYGO, which groups favor funded approaches, and the impact of the choice on the United States national savings rate, employment, and wages. We follow our literature review with a section

Table 2
(Continued)

Panel c 34 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 5% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$3,303	$ 571	$228	10.37%	$435	−2.49%	6.91%
3%	$3,303	$ 805	$322	14.63%	$527	−1.14%	9.76%
5.7%	$3,303	$1,156	$462	21.00%	$637	1.43%	**14.00%**
10%	$3,303	$2,252	$901	40.92%	$893	10.92%	27.28%

Panel d 34 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 10% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$6,899	$1,836	$ 734	15.97%	$1,701	−6.97%	10.64%
3%	$6,899	$2,347	$ 939	20.41%	$1,945	−6.08%	13.61%
5.7%	$6,899	$3,056	$1,222	26.58%	$2,226	−4.30%	17.72%
10%	$6,899	$5,096	$2,038	44.32%	$2,842	2.21%	29.55%

detailing our proposed plan, followed by a section reporting the results of some simulations of the proposal, and then discuss our plan's impact on the future of Social Security. We end the paper with our conclusions and summary.

2. Literature review

Ghilarducci (2007) presents her proposal for the reform of U.S. retirement policies and planning in her Economic Policy Institute Briefing Paper of November 20, 2007. She argues

Table 3 Panel a 56 years of age in 2008, 45 working years at 50% of median net compensation, income tax rate of 20%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$1,112	$41	$ 8	2.92%	$11	1.90%	0.73%
3%	$1,112	$46	$ 9	3.32%	$12	2.19%	0.83%
5.7%	$1,112	$52	$10	3.74%	$13	2.50%	0.94%
10%	$1,112	$63	$13	4.54%	$16	3.09%	1.14%

Panel b 56 years of age in 2008, 45 working years at median net compensation, income tax rate of 28%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$1,580	$ 81	$23	3.70%	$52	0.42%	1.44%
3%	$1,580	$ 92	$26	4.21%	$57	0.65%	1.64%
5.7%	$1,580	$104	$29	4.74%	$62	0.80%	1.84%
10%	$1,580	$126	$35	5.76%	$71	1.22%	2.24%

Continued

for establishing a system of GRAs, with mandatory participation by all employees except those covered by an adequate defined benefit plan. Five percent of worker compensation would be placed into the accounts, with the cost of the contribution split between employer and employee. Employee contributions would come from after-tax income and employer contributions would not be tax deductible expenses to the employer. The accounts would be administered by the Social Security Administration and the investment funds managed by the Thrift Savings Plan currently available to federal workers. A real, inflation-adjusted return of 3% would be paid on the accounts. A $600 tax credit would be provided to each individual participant. The $600 credit would offset the employee portion of the contribution, up to income levels of $24,000 ($24,000 times 0.025 equals $600). At retirement, benefits would be taken in the form of a life annuity. If a participant dies before reaching retirement age, half

Table 3
(Continued)

Panel c 56 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 5% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

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Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$1,767	$117	$47	3.99%	$ 88	−0.94%	2.66%
3%	$1,767	$133	$53	4.52%	$ 95	−0.80%	3.01%
5.7%	$1,767	$149	$60	5.07%	$101	−0.62%	**3.38%**
10%	$1,767	$180	$72	6.12%	$113	−0.25%	4.08%

Panel d 56 years of age in 2008, five working years at 50% of median net compensation, five working years at median net compensation, 35 following years with 10% annual increases, income tax rate of 40%, 6.25% of compensation into savings each year

Monthly payments are based on a 30-year annuity at retirement using a 2.9% nominal rate of return during the distribution phase

Nominal rate of return during accumulation phase	PIA current law	Life annuity at retirement under proposed plan	Reduction in PIA	Percentage increase in total benefit vs. current law	Monthly payment from the taxed savings alternative	Percentage increase in proposed plan total benefit vs. taxed savings alternative	Percentage reduction in PIA
0%	$2,998	$499	$199	9.98%	$469	−4.90%	6.65%
3%	$2,998	$559	$223	11.18%	$502	−4.76%	7.45%
5.7%	$2,998	$621	$248	12.42%	$533	−4.56%	8.28%
10%	$2,998	$738	$295	14.76%	$590	−4.10%	9.84%

of the participant's account value would be retained by the government and half would be available to the estate of the deceased.

Under her proposal, 401(k)s would no longer have tax advantages. Only defined benefit plans would have contributions that are tax deductible to the employer. Thus, DB plans should witness a resurgence, in Ghilarducci's estimation. This has the desirable effect, in Ghilarducci's eyes, of removing the risk of investment underperformance from the employee, while creating retirement benefits for a broader class of workers than those who currently benefit from 401(k)s.

Ghilarducci is concerned about the growth of defined contribution plans and the shift away

from defined benefit plans. A survey conducted by Hewitt Associates (2008) of employers who offer pension plans supports the notion that employers who offer pension plans prefer DC plans to DB plans; 93% of the respondents offered a DC plan, while only 48% had an ongoing DB plan. The Employee Benefit Research Institute (www.ebri.org) reports U.S. Department of Labor statistics showing an increase in the number of workers covered by DC plans from 18.9 million in 1980 to 52.2 million workers in 2004. During that same period, participants in DB plans declined from 30.1 million to 20.6 million. Given the growing problem of underfunded DB plans and the current economic turmoil, it is not clear that DB plans will grow in the near future even should Ghilarducci's plan be adopted. EBRI also reports the foregone tax revenue (tax expenditure) of employment based plans (DB, DC, and 401(k) plans) as $95 billion in 2008 with a forecast of $119 billion per year by 2013.

In comparing the proposal we present in this paper to Ghilarducci's work, our plan is similar to hers in that we both propose that traditional 401(k)s lose their tax advantaged status. As does Ghilarducci, we propose that tax credits roughly equivalent to the "tax expenditure" of 401(k) plans be created to provide incentives for workers to fund retirement accounts. In contrast to Ghilarducci, we rely on private sector fund managers rather than the Social Security Administration to administer the accounts. Our plan does not require the government to take on the risk of guaranteeing the three percent real return of Ghilarducci's plan. Our plan makes the reduction in Social Security benefits conditional on the investment results of the individual accounts. The social benefit of our proposal is that it reduces the fiscal strain soon to be placed on the federal government by payment of Social Security retirement benefits to the "baby boom" generation and the generations after, making those Social Security benefit payments more secure. We argue that this goal, securing Social Security, is far more attractive to most Americans than is Ghilarducci's emphasis on income redistribution.

The financial viability of the Social Security program in the United States has been called into question for some time. Various estimates have the Social Security trust fund (the combined Old-Age, Survivors, and Disability Insurance (OASDI) fund) no longer being able to pay all of the annual scheduled benefits by 2017. Technically, by 2017 the trust fund ratio, defined as the ratio of the assets in the trust fund at the beginning of the year expressed as a percentage of the cost during the year, would be less than 100%. Former U.S. Comptroller General (head of the General Accounting Office), David Walker places the unfunded obligations for Medicare and Social Security at almost $41 trillion and warns that, "balancing the budget in 2040 could require us to cut federal spending by 60% or raise overall federal tax burdens to twice today's levels" (Walker, 2008).

We note that many proposals have been made to address the forecasted shortfall and to keep the program solvent. A good overall review of proposals is presented in the U.S. Government Accountability Office (GAO) report (GAO, 2007) on Social Security reform. That report reviews 17 proposals made to address the trust fund's solvency. As indicated in the report, the trust fund ratio will be less than 100% beginning in 2017. The report distinguishes those proposals that suggest new revenue sources from those that would reallocate revenue from current sources; and also distinguishes those that would maintain the current structure from those that would propose new structures, such as Individual Accounts (IAs), also known as Personal Retirement Accounts (PRAs). Proposals for maintaining the

current structure include those that (1) would provide unlimited general revenue transfers as needed to maintain the solvency of the trust fund; (2) would raise or eliminate the earnings cap for the payroll tax; (3) would increase the payroll tax percentage (currently 12.4%); (4) would tax earnings above the cap at a lower rate; and/or (5) would expand coverage and taxability to those state and local employees not currently covered. Some of the proposals that advocate the creation of IAs also propose some of the other adjustments mentioned above.

Feldstein and Ranguelova (2001) and Feldstein and Samwick (2001) argue for the creation of PRAs. Such accounts would be constructed as defined contribution plans—employees would be required to contribute some small percentage of their wages (perhaps 1.5–2.0%) into their own individual accounts. The funds deposited in their accounts would be invested in a portfolio of stocks and bonds—most likely indexes representing a broad mix of equities and fixed income investments (e.g., the S&P 500 SPDRs or the Barclay's Aggregate Bond index, respectively). Feldstein and Ranguelova argue that for every dollar that must be contributed in a pay-as-you-go system (the current Social Security system), only $0.165 needs to be contributed in a PRA system, assuming an 8.5% nominal rate of return, to achieve similar benefit results. Their model assumes a 60–40% allocation between equity (proxied by the S&P 500 index) and debt (proxied by Salomon Brothers' corporate bond index), respectively. Based on 10,000 simulations of historical return data, they show that PRAs based on a 4% savings rate will generate a median annuity that is 141% of the benchmark Social Security benefit. At that level of savings there is, however, better than a 30% chance of realizing a lower benefit than that provided by the current Social Security program.

Tanner (2004) outlines a reform plan that allows workers to invest their portion of the payroll tax into private accounts. Thus, Tanner's plan places significant transition costs on the Social Security system as 50% of the current funding is removed from the Social Security system. Feldstein and Samwick (2001) present several different proposals, with the base proposal being one in which individuals transfer an amount of their payroll tax equal to 1.5% of savings into an investment account as long as the individual agrees to match that with a deposit of an equal amount from the worker's income. In their plan, individuals would have full ownership of their PRAs and have the right to bequeath accumulated funds if the individual dies before he or she retires. The plan also requires a transfer of general revenue. Results based on different real rates of return generated by a 60–40% portfolio of stocks and bonds, respectively, typically exceed the benefits projected under current law.

Nataraj and Shoven (2003) consider the introduction of PRAs while considering the current Social Security system as a risky program since benefits cannot truly be guaranteed. Thus, they model the introduction of PRAs in combination with the pay-as-you-go Social Security program as a portfolio problem, a two-tier system. For the PRA portion of the system, a 60–40% allocation in big company stocks and long term corporate bonds, respectively, is made. They find, based on simulation analysis, that the variance minimizing system is, in fact, a two-tier system; and, for utility maximization, a significant PRA contribution is recommended.

The United States is not in the lead in considering PRAs. As noted by Schieber and Shoven (1996), Chile, Australia, and Sweden, at the time of their article, have instituted or will institute some system of employer and/or employee based contribution system. Chile's

system had been recognized as a leader in this regard, although demographics and financial characteristics of the country helped greatly to underpin their program's success. Critics of Chile's reform, such as Mesa-Lago (2008), point out that Chile's privatization scheme increased differences based on income and gender in regard to coverage and funding. Furthermore, the Chilean scheme has produced a windfall for the investment companies managing the private pensions. Smith (2005) notes that these fund administrators had an annual profit of 53%, a number more typical of hedge fund managers, perhaps, than pension fund managers. Smetters and Walliser (2004) note that the structure of the transition to private accounts in Chile tended to reward younger and wealthier workers, highlighting the difficult issue of differential effects across sets of workers that virtually all attempts at reform entail.

Diamond and Orszag (2005) propose more traditional measures to deal with Social Security's projected fund shortfall. Importantly, they propose a combination of reduced benefits and increased payroll tax. They are opposed to the creation of PRAs using funds diverted from the Social Security payroll tax, since the creation of such accounts would immediately increase the deficit of the Social Security program (known as the "transition financing" issue). In addition, creation of such accounts would introduce an element of market risk not faced by individuals in the current Social Security program. Diamond and Orszag also point out the timing mismatch inherent in moving Social Security to partial privatization. To wit, the impact of diverted revenue would be immediate; the benefit of reduced Social Security payments deferred. Our proposal avoids these problems by not diverting any revenue from Social Security. The two authors also comment on the political difficulties that mandating the purchase of life annuities at retirement might bring. We, in turn, could speculate on the political difficulties that will ensue should all attempts to reform Social Security fail and the system is brought to the edge of the abyss of failure. Or, heaven forbid, actual failure. We would rather be in charge of explaining why a worker can only access his or her savings account via an annuity than to be the one explaining why their Social Security benefits have been cut 30%.

Finke and Chatterjee (2008) use the National Longitudinal Survey of Youth to assess workers' attitudes regarding privatization schemes (PRAs). They report that younger and better educated workers are more likely to support privatization of Social Security. Our proposal shares some characteristics with privatization schemes with the distinction that the impact on a recipient's Social Security benefit is determined ex-post by that worker's realized investment results.

We note that Social Security is certainly an important part of individual financial management and research into Social Security issues relevant to the mission of Financial Services Review. Recent work published in Financial Services Review that looks at various questions relating to Social Security include the previously cited work of Finke and Chatterjee (2008), as well as Spitzer (2006), McCormack and Perdue (2006), and Friedman and Phillips (2008).

3. Outline of the plan

Workers make after-tax contributions to tax-deferred savings plans. Our proposal is that 6.25% of net compensation be placed into these accounts. In our current proposal, we make

these contributions mandatory. In earlier versions of our work, we made these contributions voluntary. By making the contributions mandatory, we can get a clear sense of the dramatic impact the plan can have on the looming Social Security funding crisis. The potential impact of a voluntary plan is clouded by the uncertainty of level of participation among workers (Englehardt and Kumar, 2005).

The contributions would be invested in a manner similar to that of the Thrift Savings Plan available to current Federal government employees (www.tsp.gov/index.html). The Thrift Savings Plan is administered by the Federal Retirement Thrift Investment Board. For 2009, the board reported an expense ratio of about 0.30% for TSP funds (www.tsp.gov/rates/tsp-expense-ratio.pdf). Our proposal would require a somewhat higher expense ratio primarily because of the fact there will not be any forfeiture of accounts under our plan. The impact of this lack of forfeiture (when workers leave the plan before vesting benefits) is difficult to measure. It is also worth noting that life annuities, the settlement option we use in our simulations, have a reputation as expensive. However, it is our belief that the volume of business under our plan will provide incentive for annuity companies to earn market share by reducing expenses related to annuity contracts. We acknowledge that it is difficult to estimate precisely what the management and operating expenses of our proposal will be. Therefore, in our simulation, reported in a later section of the paper, we have chosen to use returns before expenses in forming our results.

Tax credits offset all or a portion of the cost of these investments, making the program free of out-of-pocket expense for lower income workers. As an example of the impact such tax credits will have on lower-income workers, consider a worker in 2008 earning 50% of median net compensation. That compensation level would be $13,257. We propose the worker would place 6.25% of compensation into our proposed retirement savings accounts, an amount equal to ~$829 in this case. The worker would receive a tax credit of $618, using our 2009 proposed tax credit as reported in the following section. The net cost of our proposal to the worker would be the difference of $211. To further reduce the impact of our plan, the tax credit could be increased to fully offset the deposit, at least for lower-income workers who might find the burden placed on them by our proposal to be difficult to bear. However, increasing the tax credit would eliminate one of the attractive features of our plan, revenue neutrality. By shifting the current tax expenditure on 401(k)s to our plan (the basis of the $618 figure used as our tax credit number), we are able to structure the plan to have little or no effect on the current revenue flowing to the U.S. Treasury.

At retirement, the investment account is used to purchase a life annuity (other settlement options might be made part of the plan, but we only incorporate the life annuity settlement in this paper). The amount of this annuity depends on the realized value of the investment accounts at the time of retirement or application for other Social Security benefits. In sharp contrast to Ghilarducci, we do not propose to have the Federal government guarantee the investment performance of these accounts. To do so would negate, potentially, the social benefit of our plan. We want to reduce government obligations, not create new government obligations. Social Security benefits are reduced by a fraction of the life annuity. Our plan uses the marginal tax rate of the worker/retiree at the time of retirement as the fraction. For example, if the life annuity at retirement is $1,000 and the tax rate of the worker/retiree is 28%, the worker's retirement benefit would be reduced by $280.

Our plan differs from the proposals by Feldstein, Ranguelova, and Samwick and those of Tanner cited above in that none of a worker's payroll tax will be diverted into investment accounts. Therefore, transition costs for our plan are minimal. All money deposited into the accounts will be from the after-tax income of the workers. Collections from the payroll tax on workers, as well as income tax collections, stay as they are under current law. The tax credit is funded by eliminating further contributions to current 401(k) plans. We do note that the tax-deferred growth in the savings plans is likely to exceed the equivalent tax expenditure for ongoing 401(k) plans as it is likely that our proposal will have greater participation than current 401(k)s. Thus, admittedly, tax expenditure on these retirement plans might grow somewhat in future years relative to current forecasts. However, under our proposal, there is no immediate reduction in taxes collected by the Federal government.

To understand the impact our proposal will have on Social Security, a little background on how Social Security benefits are calculated is in order. To determine one's Social Security benefit, Social Security first calculates the averaged indexed monthly earnings (AIME) of a worker. Then the primary insurance amount (PIA) is determined from the AIME, as described below. The PIA is the basic benefit amount to be paid to a retiree. Benefits to spouses, survivors, and dependents are some fraction of PIA. AIME is the average of a worker's highest 35 years earnings, where the earnings are indexed for inflation using the CPI. Social Security brings all the worker's yearly earnings, or the cap in earnings for that year should earnings exceed the wage cap ($102,000 in 2008), to their inflation-indexed value at the year of retirement, then selects the highest 35 years of these earnings, and then calculates the average of these 35 years of earnings. Dividing this number by 12 yields the AIME.

The AIME is used to calculate the worker's PIA. The PIA is the basic Social Security monthly benefit paid to retirees. Calculation of the PIA reflects two "bend points" that allow for higher income replacement for lower-income workers than for higher-income workers. For 2008, the first bend point occurs at $711 of AIME and the second bend point is at $4,288. For 2008, PIA is calculated as 90% of AIME at or below $711 plus 32% of AIME between $712 and $4,288 plus 15% of AIME in excess of $4,288. Thus, for higher-income workers, the marginal income replacement ratio from Social Security is 15%.

Under our proposal, at the time of filing for Social Security benefits, the realized value of the tax-deferred savings is used to buy a life annuity (in the simulations reported in the following section we use a 30 year term annuity to proxy for a life annuity). A variation allowing the worker to take the tax-deferred savings as a lump sum or partially as a lump sum and partially as an annuity could be made a feature of our proposal, but for the remainder of this paper we will assume that the savings are used to purchase a life annuity. Social Security benefits are adjusted annually for inflation. To place the life annuities on a similar basis, we build an inflation adjustment into the life annuity. We proxy this by using real, inflation-adjusted rates of return in calculating our annuity simulations. The 2009 report of the Social Security trustees (Board of Trustees, 2009), posits various interest scenarios. The trustees' middle scenario assumes inflation of 2.8%, real rates of return of 2.9%, and, therefore, nominal rates of 5.7%. We incorporate these interest rate assumptions into our simulation. The PIA determined at the time of filing for Social Security is reduced by a fraction of the life annuity amount. We propose that the marginal tax rate of the beneficiary be used as this

fraction. Thus, we do build progressivity into our plan without changing the main focus of our plan from solving the Social Security crisis.

We assume that our new retirement accounts replace, in effect, the current 401(k) retirement plans. Thus, new savings into 401(k)s would no longer be possible. However, even in the absence of tax incentive plans such as 401(k)s, investors can choose to save in taxed accounts. We provide insight into the benefits of our plan versus such taxed savings alternatives by simulating how such taxed savings would grow under the rate of return assumptions of our simulations. In our simulation for taxed alternatives, we reduce the 6.25% of net compensation contributions by the tax credits foregone. We then grow these contributions at after-tax rates of return. The point of comparison to our plan is the values of the life annuities that come from these taxed savings added to expected Social Security benefits, without reduction, versus our plan's tax deferred life annuity plus the reduced Social Security benefits as we propose.

Our simulations assume that the contributions begin in 2009. Only workers subject to FICA tax participate. The workers would be eligible to begin drawing funds from the tax deferred accounts at the time they file for Social Security benefits. Withdrawals from the tax deferred accounts would not be available until meeting the requirements for a Social Security benefit, including disability, survivor benefits, and early retirement. At the time a benefit is applied for, the PIA would be adjusted as described above. The tax-deferred savings account would be the property of the worker and would transfer at death to his or her heirs or to the estate (under Ghilarducci's plan only half the assets in the GRA would transfer). The transfer would be either in the form of a life annuity and associated PIA reduction for survivors' benefits (as outlined above), or as some fraction of the account value as a lump sum. We propose the fraction to be the marginal tax rate of the beneficiary.

Anyone familiar with the power of compound interest over long periods of time understands the value of watching investment accounts grow on a tax deferred basis. Note that in contrast to current 401(k) type plans, our proposal does not impose any adjusted gross income (AGI) limits nor do we have any limits because of participation in other retirement plans.

4. Results for three sets of simulations

We now examine the impact our proposal would have on three stylized sets of workers—young workers at various income levels, a second set of simulations for middle-aged workers at various income levels, and a third for older workers. Actual data are used up to 2006; the data were downloaded from the Social Security Website (www.ssa.gov). After 2006, the CPI is assumed to grow at 3%, median compensation is assumed to grow at 3%, and the Social Security earnings cap is assumed to grow at 4.14% (the compound growth rate in the earnings cap was 4.14% for the period from 1996 through 2008). The bend points after 2009 are simulated as the same average percentage of the Social Security earnings cap as they exhibited for the period from 1996 through 2009. The tax credit is assumed to be $618 in 2009 and to grow at 3% annually. The CPI adjustment factors used in calculating the AIME and PIA assume inflation of 3% per year. The simulations use accumulation phase rates of

return on the tax-deferred investments of 0%, 3%, 5.7%, and 10%. During the distribution phase, we use a 2.9% nominal rate and a 30 year term to simulate the amount of a life annuity payable at retirement. The 5.7% nominal rate and the 2.9% real return are consistent with the assumptions of the Social Security trustees (Board of Trustees, 2009) and close to the 3% real return used by Ghilarducci.

The tax-deferred contributions start in 2009 and, for purposes of the simulation, are assumed to be 6.25% of the compensation of the worker. All workers enter the workforce at age 22 and retire at age 67 (a 45 year working life). We simulate four levels of income for each set of workers. One approach has the worker earning 50% of median net compensation for each of the 45 years. The second has the worker earning the median net compensation for each year. A third simulation has the worker earn 50% of median compensation for five years, median compensation for the next five years, and then realize 5% raises each year for the following 35 years. We believe this to be the earnings stream that is our most realistic simulation. Finally, we model an earnings stream that has the worker earn 50% of median compensation for five years, median compensation for the next five years, and then realize 10% raises each year for the following 35 years. This last simulation creates a very high income earner in the last years of his or her working life. Thus, we establish a relatively low income earnings path, one middle-income path, and a two relatively high income paths. To provide some perspective, we note that for 2006 the Social Security earnings cap was $94,200; median net compensation was $24,892, and the 90th percentile for AGI was $108,904 (www.taxfoundation.org/publications/show/250.html).

The taxed savings alternatives reported in the tables use tax rates of 20% for low-income workers, 28% for middle income workers, and 40% for high income workers. We place 6.25% of compensation into these taxed accounts and grow these deposits at an after-tax rate of return calculated by multiplying the accumulation phase rate of return by $(1 - t)$ where t stands for the tax rate. We reduce these taxed values by the values of the tax credits forgone. We assume these taxed accounts' future values are used to purchase a 30 year term annuity at an interest rate of 2.9%.

Table 1 uses four panels, Panels a, b, c, and d to report the results of our simulations for young workers. These are workers entering the workforce at age 22 in 2008. Even at very low rates of return during the accumulation period, these young workers are better off under our plan than they would be under current law regarding Social Security benefits.

Panel a of Table 1 provides the results of our simulation for 22 year old low income workers. At the historically modest nominal return of 5.7% during the accumulation phase, these low income workers realize an improvement in their total benefit of more than 21% under our proposal when compared to projected Social Security PIA values. In comparison to the taxed saving alternative, again using 5.7% for the accumulation phase, our proposal provides these low income workers with increased benefits of 15.25%. Of particular interest to this paper is the observation that the reduction in PIA for these low income workers range from 1.68% to 16.90%, depending on the realized rate of return during the accumulation phase. Panel b of Table 1 reports our results for workers entering the workforce in 2008 and earning the median compensation each year of their working life. The pattern is similar to that of Panel a of Table 1, but the advantages to our plan are higher in each result.

Our most striking results are reported in Panel c of Table 1. These are workers entering

the workforce in 2008 and who earn 50% of median compensation for five years, the median compensation for five years, and earn 5% annual raises thereafter. We argue that this is a realistic pattern of income and best captures the impact of our proposal. Using 5.7% as the reference return during the accumulation phase, young workers with this income pattern will earn a total benefit more than 22% greater than their projected PIA under current law. They will benefit by ~4% more in comparison to the taxed savings alternative. Most importantly, our proposal generates a reduction in PIA (at 5.7% return) of 15.13% for this typical income pattern (reported in bold). We note that the 2009 report of the Social Security trustees (Board of Trustees, 2009) reported that one solution to the Social Security funding crisis is an immediate reduction in benefits of 13.3%. While our proposal does not generate immediate reductions of this magnitude for all workers, we do achieve reductions of this magnitude given sufficient lead times (i.e., for younger workers).

Panel d of Table 1 reports our results for young workers that turn out to be high income earners in the later years. For workers who follow the income pattern given in Panel d, their end year compensation at age 67 is ~10 times the forecast median compensation in 2052 when they will retire. For such high income workers, the benefits of our proposal are clear.

Table 2 is also in four panels, Panels a through d. Table 2 looks at workers who are 34 years old in 2008. These workers are simulated to have a working career of 45 years and retire in 2041. The income levels for the four panels are the same as described in the four panels of Table 1. The patterns in Table 2 are quite similar to those reported in Table 1 but the magnitudes of the effects are reduced. This is to be expected as these 34 year olds have 12 fewer years of compound interest working on the tax deferred savings accounts. Using 5.7% return as a representative rate of return during the accumulation phase, Panel c of Table 2, simulating what we consider to be our most typical earner, shows a reduction in Social Security PIA of 14.00% (reported in bold). For all panels of Table 2, the reduction in PIA lies between 2.30% and 29.55%.

Table 3 gives the results of our simulation for older workers. These are workers who are 56 in 2008 and who will retire in 2019 after 45 years of work. Note that there are positive but comparatively small benefits to these workers from participation in our proposal. For higher income older workers (Panels c and d) our proposal generates a negative position relative to traditional taxed savings. This reflects the fact that the value of the tax credit and tax deferred savings do not compensate for the reduction in PIA. Reductions in PIA for Table 3 range from 0.73% to 9.84%. Once again using 5.7% as the reference accumulation phase return, Panel c of Table 3 shows that the value of the life annuity is $149 per month and the reduction in PIA $60 per month. Thus, these workers are better off by 5.07% compared to current Social Security promises. However, the reduction in PIA is only 3.38% (reported in bold) and these workers might reasonably be expected to prefer traditional taxed savings to our plan.

The Social Security Administration reports the distribution of retirement benefits for 2006 (www.socialsecurity.gov/policy/docs/statcomps/supplement/2007/5b.html#table5.b6). We used this empirical distribution of benefits to impute the associated distribution of AIME for 2006. We used the midpoints of the reported intervals and standardized the results by dividing by the median net compensation for 2006. We then applied this empirical distribution function of income relative to median income in our simulations. Assuming the 2006

Table 4 Weighted average reduction in PIA based on 2006 empirical distribution function of Social Security benefits

Age in 2008	Rate of return during accumulation phase	Percentage reduction in PIA
22	0%	3.39%
22	3%	5.97%
22	5.7%	**10.99%**
22	10%	34.06%
34	0%	4.10%
34	3%	6.06%
34	5.7%	**9.07%**
34	10%	19.55%
56	0%	1.41%
56	3%	1.61%
56	5.7%	**1.81%**
56	10%	2.20%

EDF continues to hold, we calculated the distribution of benefits for each of our three sets of workers. Table 4 reports the weighted average percentage reduction in PIA for our simulations. Using the 5.7% reference rate, for our 22 year old workers, the weighted average reduction in PIA is 10.99%. For the 34 year olds, at a 5.7% accumulation phase rate, the reduction in PIA is 9.07%. For older workers, with less time to benefit from the power of compound interest, the reduction in PIA is only 1.81% at that 5.7% accumulation phase rate of return.

5. Impact on Social Security

Tax revenue to the U.S. Federal government has been ~18% of GDP since World War II (Citizen's Guide, 2008). Projections are that by 2040, spending on just three Federal programs, Social Security, Medicare, and Medicaid, along with interest on the Federal debt will exceed this 18% level (Board of Trustees, 2009). To continue to support the current functions of the federal government—defense spending, the courts, the EPA, HUD, all other U.S. Government functions—will require tax revenue significantly in excess of 18% of GDP. The tax rates needed in the future to fully support the continued functions the Federal government engages in today may well prove unacceptably high to the workers of 2040.

As an alternative, the government could reduce these social programs by reducing their promised benefits. However, this has proved politically difficult to do in the past and will likely remain difficult to do in the future. Our plan offers a partial and important solution to this developing funding crisis.

Admittedly, our plan is not a complete solution. Our plan has little power to resolve the near term crisis. However, for those workers retiring twenty or more years into the future, the power of compound interest on sustained investment streams at reasonable rates of returns allows our plan to provide dramatic reductions in Social Security underfunding.

Looking at Panel c of each of the three tables, we can get a sense of the impact on Social

Security from adopting our proposal. Panel c uses the income pattern we consider most representative of a typical worker. For the 22 year old worker of Table 1, Panel c of Table 1 shows that these workers will have substantially improved retirement income even if they experience very low rates of return during the accumulation period. We also observe substantial reductions in Social Security obligations. These results highlight the power of compound interest over long periods of time. Using the 5.7% nominal rate assumption of the Social Security trustees (Board of Trustees, 2009), Panel c of Table 1 shows a 15.13% reduction in PIA. Using a 10% return during the accumulation phase, the reduction in PIA is 40.47%. It is worth noting that the average return since 1926 for U.S. equity markets has been about 14%. If that history repeats over the next half-century, Social Security will not only not be underfunded, but will have sufficient reduction in benefits that the payroll tax can be cut or directed towards other programs such as Medicare or debt reduction.

Panel c of Table 2 tells a similar story for our 34 year old worker. At 5.7% rate of return during the accumulation period, our plan creates increased benefits of 21% versus current Social Security promises. Our plan is more attractive than the taxed savings alternative. Our plan indicates that Social Security benefits are reduced by 14% when these workers retire in 2041.

Unfortunately, our proposal does little to increase the retirement security of the 56 year old workers reported in Table 3. Panel c of Table 3 indicates that increases in benefits under our plan for these older workers range from 3.99% to 6.12%. Reductions in PIA are small, ranging from 2.66% to 4.08%. At low rates of return during the accumulation phase, these older workers would be better off investing in the taxed alternative than investing in our proposed tax-deferred accounts. At low rates of return, the tax advantages embedded in our plan fail to outweigh the reductions in PIA. For higher income older workers, Panel d of Table 3, the relative underperformance of our plan versus traditional savings exists at each level of rates of return during the accumulation phase.

We share many of Teresa Ghilarducci's (2007) concerns regarding the disparate impact of 401(k) plans on differing income classes. As she reports, the benefits of current 401(k)s are disproportionately to the wealthy. We also note her concerns that so few of lower income workers are taking advantage of 401(k) and other such retirement plans. This lack of preparation for retirement among the general population is indeed distressing. Ghilarducci (2007) uses a tax credit of $600 in 2008 as an offset to her mandatory GRA costs. We adopt her approach although we differ from Ghilarducci in that in our plan all contributions come from the worker. Ghilarducci has the contributions split half-and-half between the worker and the employer.

We differ from Ghilarducci in that we prefer that the social benefit from such tax advantaged retirement plans be focused on increasing the viability of Social Security rather than reducing income inequality. We would take little comfort from any plan that marginally reduced income inequality, while the burden Social Security places on the Federal budget causes the very existence of Social Security to come into doubt by the time today's young workers reach retirement age.

The current limitations on today's retirement schemes appear, to us, to be driven by a concern for social equity—as a people, apparently, we Americans do not want the bulk of the benefit of such plans to go to just a small number of high-income workers. While we would expect our plan to indeed be quite attractive to younger workers who attain high income levels before retirement, and thus seem to run afoul of this social equity notion, we believe

that the social benefit of our plan—solution of the Social Security underfunding crisis—will make our plan politically palatable.

We believe our plan would encourage an increase in the national savings rate. While critics question the validity of some of the reported statistics regarding the U.S. savings rate, the reported numbers since 2005 show a savings rate of less than 1%, with the exception of the second quarter of 2008 which came in at about 2.5% (Bureau of Economic Analysis, 2008, www.bea.gov/briefrm/saving.htm). Some recent evidence suggests that Americans are responding to the economic crisis of 2009 by increasing their savings (http://online.wsj.com/article/SB123120525879656021.html). We argue that the current restrictions on saving for retirement imposed on higher income workers works to reduce the national savings rate. By mandating all workers save in a tax-deferred account, without imposing AGI or other limits, we create a significant pool of new investment capital. Recall that for both Roth IRAs and traditional IRAs, maximum contributions are limited and the availability of the plans removed at relatively low AGI. 401(k)s and other qualified plans impose contributions restrictions and earnings restrictions that reduce the attractiveness of such plans to high income earners. Nonqualified plans (Rabbi trusts, incentive stock options, etc.) are structured to be attractive precisely to high income earners. The number of workers able to participate in nonqualified plans is limited because of "top hat" restrictions. Our plan eliminates these disincentive effects, creating a much more robust retirement environment.

6. Conclusions

As the baby boom generation of Americans approaches retirement, concerns about the viability of the U.S. Social Security system abound. Private sources of retirement income are also in flux. Companies are canceling defined benefit plans or substituting defined contribution plans in their stead. However, defined contribution plans, such as 401(k)s, exhibit serious deficiencies. In particular, participation in 401(k) plans is skewed towards higher income employees. Risk of underperformance of investment in DC plan is borne by the worker. The tax expenditures associated with 401(k)s are judged to have failed to achieve the desired social benefit of secure retirement for large numbers of U.S. workers.

We propose a reform of U.S. retirement policy that solves these deficiencies. Following the lead of Teresa Ghilarducci (2007), we redirect 401(k) tax expenditures into mandatory retirement savings accounts. We modify her proposal by making the social benefit of these redirected tax expenditures to be increasing the solvency of the U.S. Social Security system.

5.1. Our proposal

- Solves the looming underfunding crisis of Social Security
- Increases retirement security and retirement income for all workers
- Reduces anxiety regarding investment performance of the retirement accounts by determining reductions in Social Security benefits ex-post investment performance
- Has virtually no transition costs
- Results in little or no change in current government revenues

- Substitutes tax expenditure on our proposed retirement accounts for current 401(k) tax expenditure
- Redirects those 401(k) tax expenditures into tax credits that, for lower income workers, make the effective out-of-pocket cost of our proposal nil
- Substantially increases the U.S. savings rate

References

Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Funds. (2009). *The 2009 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Funds*, May, 12, 2009.

Citizen's Guide. (2008). The Federal Government's Financial Health: A Citizen's Guide to the 2008 Financial Report of the United States Government (available at www.gao.gov/financial/citizensguide2008.pdf).

Diamond, P., & Orszag, P. (2005). Saving Social Security. *Journal of Economic Perspectives, 19*, 11–32.

Englehardt, G. V., & Kumar, A. (2005). Social Security personal-account participation with government matching. *Journal of Pension Economics and Finance, 4*, 155–179.

Feldstein, M., & Samwick, A. (2001). *Potential paths of Social Security Reform*. NBER Working Paper No. 8592, November 2001.

Feldstein, M., & Ranguelova, E. (2001). Individual risk in an investment-based Social Security system. *American Economic Review, 91*, 1116–1125.

Finke, M. & Chatterjee, S. (2008). Social Security: Who wants private accounts? *Financial Services Review, 17*, 289–307.

Friedman, J., & Phillips, H. E. (2008). Optimizing Social Security benefit initiation and postponement decisions: A sequential approach. *Financial Services Review, 17*, 155–170.

Ghilarducci, T. (2007). *Guaranteed retirement accounts: Toward retirement income security*. Economic Policy Institute Briefing Paper No. 204. November 20, 2007.

Hewitt Associates. (2008). *Survey Findings: Hot Topics in Retirement 2008*. Hewitt Associates LLC, Lincolnshire, IL.

McCormack, J. P., & Perdue, G. (2006). Optimizing the initiation of Social Security benefits. *Financial Services Review, 15*, 335–348.

Mesa-Lago, C. (2008). Social protection in Chile: Reforms to improve equity. *International Labor Review, 147*, 377–402.

Nataraj, S., & Shoven, J. B. (2003). Comparing the risks of Social Security with and without individual accounts. *The American Economic Review, 93*, 348–353.

Nofsinger, J. R. (2008). *The Psychology of Investing*, 3rd ed. Boston, Pearson Prentice Hall.

Schieber, S. J., & Shoven, J. B. (1996). Social Security reform: Around the world in 80 ways. *AEA Papers and Proceedings, 86*, 373–377.

Schwabish, J. A., & Topoleski, J. H. (2009). Risk tolerance and retirement income composition. *Journal of Pension Economics and Finance, 8*, 131–151.

Smetters, K., & Walliser, J. (2004). Opting out of Social Security. *Journal of Public Economics, 88*, 1295–1306.

Smith, G. (2005). Chile: A lopsided miracle. *BusinessWeek, October 3*, 2005.

Spitzer, E. (2009). *Privatize Social Security?! Can we finally kill this terrible idea?* (available at www.slate.com/id/2210414).

Spitzer, J. (2006). Delaying Social Security payments: A bootstrap. *Financial Services Review, 15*, 233–245.

Tanner, M. (2004). *The 6.2 Percent Solution: A Plan for Reforming Social Security. Cato Project on Social Security Choice*. Cato Institute Social Security Paper No. 32, February 17, 2004.

United States Government Accountability Office (GAO). (2007). *Social Security Reform: Greater Transparency Needed About Potential General Revenue Financing*. Report to Congressional Committees, GAO-07–213, March 2007.

Walker, D. (2008). Call this a crisis? Just wait. *Fortune, 158*, 119–120.

Table 5 Appendix

In this appendix, we provide a partial printout from our spreadsheet calculations. For the example below, we use a worker born in 1986 who enters the workforce in 2008 at age 22. The worker is assumed to earn 50% of the median net compensation for five years, then earn the median compensation for the next five years, and then receive 5% per year raises until retirement. We have the worker make his first contribution into our proposed tax deferred retirement account in 2009. The worker retires at age 67 in 2053. We simulate (forecast) the worker's AIME and PIA in the year of retirement. We also simulate the future values of the savings account in 2053 at various accumulation phase rates of return. We report the monthly payments for a 30 year annuity at a 2.9% rate of return (compounded monthly). We report the monthly payments for a 30 year annuity at a 2.9% rate of return (compounded monthly) for the taxed savings alternative. We use a tax rate of 40% for this age and income combination.

Year	Median net Compensation	Forecast earnings stream	Indexed earnings	Contributions at 6.25% of compensation	Lesser of tax credit or contribution	Average of top 35 indexed earnings
2008	$26,407	$ 13,204	$ 49,930		n/a	$143,844
2009	$27,199	$ 13,600	$ 49,930	$ 850	618	Forecast AIME
2010	$28,015	$ 14,008	$ 49,930	$ 875	637	$11,987
2011	$28,856	$ 14,428	$ 49,930	$ 902	656	
2012	$29,721	$ 14,861	$ 49,930	$ 929	675	Forecast break points
2013	$30,613	$ 30,613	$ 99,861	$ 1,913	696	$4,411 and $26,586
2051	$94,128	$181,005	$192,028	$11,313	2,139	Forecast PIA in 2053
2052	$96,952	$190,055	$195,757	$11,878	2,203	$6,394

Rate of return during accumulation period	Future value of tax-deferred contributions	Monthly payments, tax-deferred approach, 30 year annuity, 2.9% rate	Future value of taxed alternative	Monthly payments, taxed alternative, 30 year annuity, 2.9% rate
0%	$ 217,939	$ 907	$162,907	$ 678
3%	$ 347,911	$1,448	$208,748	$ 869
5.7%	$ 580,969	$2,418	$268,702	$1,118
10%	$1,554,093	$6,469	$426,446	$1,775