ISSUE BRIEF

HOW EARNINGS AND FINANCIAL RISK AFFECT PRIVATE ACCOUNTS IN SOCIAL SECURITY REFORM PROPOSALS

Background

The American public widely believes that the Social Security program faces a long-term financing problem and will be bankrupt within 40 years. The Social Security Trustees project that the trust funds will be depleted by 2042, and that annual tax revenues after 2042 will cover about 72 percent of annual expenditures. Consequently, over the past decade, several Social Security reform proposals have been offered to shore up the program's finances.

Most of the plans would partially privatize the Social Security program by establishing individual accounts funded by diverting part of the payroll tax to the accounts. Under such a plan, an individual's retirement income would largely depend on how much was contributed to the account and the returns earned on the account assets. The proponents of these plans claim that, among other things, future Social Security beneficiaries can "reasonably expect" to receive higher benefits under their plan than under the current program. However, the simulation results of the distributional impacts[1] offered in support of these claims is often questionable and unconvincing.

The distributional analyses most of the proponents offer often rely on a few hypothetical workers who have constant earnings throughout their working careers. Furthermore, the analyses generally assume that asset returns are constant at their historical average in each and every year. These analyses, therefore, ignore two important risks to adequate retirement income—earnings risk and financial risk—in simulating the impacts of the reform proposals.[2]

The Twin Problems

The two main problems of most distributional analyses are the use of (1) stylized workers to represent typical workers, and (2) constant and possibly overly optimistic projections for stock market returns. These two problems mean that two important sources of benefit variation among retired workers are ignored. The first source of benefit variation is the dispersion of benefits due to the differing lifetime earnings paths or the sequence of earnings over the working career of workers retiring in any one year. For example, two workers with the same lifetime average indexed earnings, one with high early career earnings and the other with high late career earnings, would receive the same current-law Social Security benefit but would accumulate very different individual account balances. The second source of variation is due to differing patterns of asset returns among individuals and across years. For example, two identical workers (with identical lifetime earnings patterns and investment choices) may receive different benefit levels from an individual account because they retire in different years, that

[1] A distributional analysis estimates the effect a specific reform proposal will have on the retirement income of various groups of workers.

[2] Risk refers to uncertainty about future earnings and asset returns. It is usually quantified by measures of variability such as the variance.

is, they accumulated their retirement assets in different periods with different returns.

Retirement income is largely based on lifetime earnings. However, many people, especially women, spend a number of years out of the workforce because of caregiving responsibilities. Many workers experience layoffs and unemployment for varying lengths of time. Figure 1 shows the average earnings over a 40-year working career for men and women. The dollar amounts are expressed in constant 2002 dollars, and the patterns show that the earnings paths over a working career are anything but constant.

In an analysis of real-life earnings patterns, Bosworth, Burtless, and Steuerle (1999) found that few workers have level career earnings paths and that using stylized workers "represents a serious distortion of actual labor market experience." Au, Mitchell, and Phillips (2004) reach many of the same conclusions as Bosworth, Burtless, and Steuerle. They specifically note that the stylized workers traditionally used as examples miss all the years with no earnings. In a simulation of an individual account with a 4 percent return, the hypothetical worker accrues twice as much retirement wealth as an actual worker from Au, Mitchell, and Phillips's sample.

In analyses of individual account retirement systems, one needs to make assumptions about asset returns. The most common assumption is that average future returns will be equal to average past returns.[3] Furthermore, most analysts assume that future returns will be constant year in and year out. The 1994-96 Advisory Council on Social Security assumed that future real stock returns will be 7 percent, and real Treasury bonds returns will be 3 percent. The President's Commission to Strengthen Social Security (2001) assumed future stock returns of 6.5 percent, corporate bond returns of 3.5 percent, and Treasury bond returns of 3 percent. Feldstein and Liebman (2002) assumed a constant 5.5 real return on the individual account portfolio in their analysis, which they argue is a conservative estimate of future returns.

Baker (1999) argues that the economic assumptions used to project Social Security finances are not consistent with a 7 percent return on stocks. He points out that a 7 percent stock return implies higher future economic growth than generally assumed, and the higher economic growth would solve Social Security's projected long-term financing problem. Others have looked at this issue as well and reach different conclusions: Diamond (2000) recommends that analysts should assume lower stock returns for the next decade or so and then a 7 percent real return thereafter; Campbell (2001) guesses that the long-term average stock returns will be 5 to 5.5 percent; and Shoven's (2001) best guess for real stock returns over the long-term is 6 to 6.5 percent.

Rather than examining average returns, Burtless (2000) focuses on financial risk or the variation in asset

[3] The average returns refer to the geometric average of returns over the specified period. The geometric average return is the annualized cumulative return on an asset over the specified period (assuming all distributions and dividends are reinvested), which is appropriate for an individual account plan in which workers will not be allowed to withdraw from their accounts until they retire.

market returns. Using historical asset return data from 1871 to 1999, he created 89 scenarios using asset returns from every 40-year period since 1871 (i.e., 1871-1910, 1872-1911, etc.) and a stylized worker with a 40-year earnings history. He finds "startling" variation across scenarios in realized returns with internal rates of return varying from 1.54 percent to 9.87 percent. He concludes that the "U.S. experience over the past century suggests that neither the value of financial assets nor their real return is assured."

The variation in average returns since 1871 is considerable. Figure 2 shows the average returns for sequential 40-year periods since 1871 for a 100 percent stock portfolio (the dashed line), a 100 percent bond portfolio (the solid line), and a 60 percent stock/40 percent bond portfolio (the dotted line). As one can see, there is considerable variation in both stock and bond returns. Assuming a constant return in distributional analyses will miss this considerable variation and very likely understate any downside risks to investing in financial markets.

Implications of Financial and Earnings Risk

To focus on the consequences of earnings and financial risk, we examine three stylized reform proposals that include small individual accounts (IAs) and a reduced traditional Social Security benefit. The plans are:

1) the Gramlich IA plan, which would divert 1.6 percentage points of the payroll tax to the IA and progressively reduces the traditional benefit. The benefit received is the sum of the annuitized IA and the reduced traditional benefit;
2) The 2 Percent IA plan, which would divert 2 percentage points of the payroll tax to the IA and proportionally reduce the traditional benefits by about 19 percent;
3) The 4 Percent IA plan, which would divert 4 percentage points of the payroll tax to the IA and proportionally reduces the traditional benefits by about 38 percent.

In the analysis, 91 asset returns scenarios are created for a sample of individual workers.[4] The analysis assumes a 60 percent stock and 40 percent U.S. Treasury bond portfolio.

[4] The data file of 789 individuals aged 62 years was developed that includes 40 years of annual earnings information for each individual. Two publicly available micro datasets were used to create each individual's 40-year earnings record: the March 1978 Current Population Survey (CPS)/Social Security Summary Earnings (SER) exact match file, and the Panel Study of Income Dynamics. Most individuals have at least one year between the ages of 22 and 61 with no earnings recorded. Financial risk is captured by using actual annual asset market returns to create 91 40-year asset return scenarios. The first scenario uses the asset returns from 1871 to 1910 combined with the 40-year earnings history to create an individual account balance for each worker in the sample. The second scenario uses asset returns from 1872 to 1911 to create the account balance, and so on through to the 91st scenario.

Given the overwhelming amount of information, only the results from a limited number of scenarios are reported. The scenarios yielding the average individual account balance (after 40 years) at the 10th percentile, the median, and the 90th percentile, as well as the minimum and maximum were selected. These scenarios are referred to as the worst (i.e., the minimum), low (i.e., 10th percentile), median, high (i.e., the 90th percentile) and the best (i.e., the maximum) asset returns scenarios. The five scenarios were chosen for men and women separately because the differing earnings patterns for men and women lead to a different ranking of the scenarios—men and women accumulate differing account balances from the same sequence of asset returns.

Figure 3 shows the scatter diagrams of IA benefits and current-law (CL) Social Security benefits for the sample under the three stylized IA plans. These diagrams show the results for a constant asset returns scenario and correspond to the evidence presented by Feldstein and Liebman (2002) in support of IA plans.[5] In these diagrams, the points show the simulated IA benefit for each worker while the solid line with two kinks shows the CL benefits that each worker would receive at age 62. The three diagrams in figure 3 show that under all three IA plans, most workers would receive higher benefits than under current law, since most of the points lie above the kinked solid line, which is the conclusion Feldstein and Liebman reach as well (2002). But workers with lower lifetime earnings are more likely to receive IA benefits that are slightly lower than their CL benefits than are higher lifetime earners. These results, while ignoring financial risk, do show the implications of earnings risk or variation—two workers with the same average lifetime earnings level may receive different benefit payments from a Social Security system that includes individual accounts.

These results provide very incomplete information about the true range of possible outcomes, however, because they ignore financial risk. The three scatter diagrams in figure 4 show the full range of possible outcomes under the three stylized IA plans. Each diagram shows the benefits each worker would receive under five asset returns scenarios—the worst, low, median, high, and best scenarios (the points denoted with various symbols)—and under the current law program (the kinked solid line). In each diagram, the top orange points show the benefits under the best returns scenario, the green Xs show the benefits under the high return scenario, the yellow squares refer to the median returns scenario, the red +s refer to the low returns scenario, and, last, the blue circles are for the worst returns scenario. The three diagrams clearly show that the range of possible outcomes is much larger than what was indicated by using just the constant returns scenario (compare to figure 3), and that there is a real possibility that all or most individuals could be worse off under an IA plan—there is a considerable lower tail in the range of possible outcomes with benefits below current-law benefits. In fact, on average,

[5] The benefits under the three IA plans with a 60 percent stock and 40 percent bond portfolio were simulated using a constant annual asset return of 5.24 percent. This is the return on the 60/40 mixed portfolio assuming stocks have a 7.2 percent real return and bonds have a 2.3 percent real return (the long-term average returns).

workers face a 30 percent (under the Gramlich IA plan) and a 35 percent chance (under the 2% and 4% IA plans) of receiving IA benefits that are below their CL benefit. Furthermore, lower lifetime earners have a 50 percent chance of receiving IA benefits that are below their CL benefit.

In comparing the scatter diagrams across the three plans, it is noteworthy that the range of benefits increases as lifetime earnings increase (i.e., the scatter plots fan out somewhat). This is readily apparent in following the best asset returns scenario plot in the 2 percent and the 4 percent IA plans (also see figure 3). As exposure to asset markets increases, variability of benefits increases. Two people with essentially the same lifetime earnings levels would receive essentially the same CL benefits. But in an individual account system facing the same asset returns and investing in the same 60 percent stock/40 percent bond portfolio, these two workers could receive very different annuity payments. This difference suggests that earnings patterns matter in determining retirement income in individual account systems.

Conclusions

The evidence presented in this study clearly shows that both financial and earnings risk must be incorporated into distributional analyses to obtain the true range of possible outcomes in retirement income systems with individual investment accounts. Of course, future retirees, especially women, will likely have different earnings patterns from current retirees, and future asset returns are unlikely to follow the same paths as past returns. Nevertheless, the claims of Social Security privatization proponents that future retirees can "reasonably expect" to receive higher benefits under their plan is probably an overstatement. There is a fairly substantial probability that some cohorts of retirees would be worse off under a privatized Social Security system than they are under the current system.

References

Au, Andrew, Olivia S. Mitchell, and John W.R. Phillips (2004), "Modeling Lifetime Earnings Paths: Hypothetical versus Actual Workers," Boettner Center for Pensions and Retirement Research working paper 2004-3.

Baker, Dean (1999), "Saving Social Security with Stocks: The Promises Don't Add Up," in Richard C. Leone and Greg Anrig, Jr. (eds.), *Social Security Reform* (New York: The Century Foundation Press).

Bosworth, Barry, Gary Burtless, and C. Eugene Steuerle (1999), *Lifetime Earnings Patterns, the Distribution of Future Social Security Benefits, and the Impact of Pension Reform*, Center for Retirement Research at Boston College, CRR WP 1999-06, December.

Burtless, Gary (2000), *Social Security Privatization and Financial Market Risk*, Brookings Institution WP No. 10, February.

Campbell, John Y. (2001), "Forecasting U.S. Equity Returns in the 21st Century," in Social Security Advisory Board, *Estimating the Real Rate of Return on Stocks Over the Long Term*, Social Security Advisory Board, Washington, DC available at www.ssab.gov/NEW/Publications/Financing/estimated rate of return.pdf accessed September 9, 2004.

Diamond, Peter A. (2000), "What Stock Market Returns to Expect for the Future?" *Social Security Bulletin*, 63(2): 38-52.

Feldstein, Martin and Jeffrey B. Liebman (2002), "The Distributional Effects of an Investment-Based Social Security System," in Martin Feldstein and Jeffrey

B. Liebman (eds.), *The Distributional Aspects of Social Security and Social Security Reform* (Chicago: University of Chicago Press): 263-326.

President's Commission to Strengthen Social Security (2001), *Strengthening Social Security and Creating Personal Wealth for All Americans*, available at www.csss.gov. Accessed September 9, 2004.

Shoven, John B. (2001), "What Are Reasonable Long-Run Rates of Return to Expect on Equities," in *Estimating the Real Rate of Return on Stocks Over the Long Term*, Social Security Advisory Board, Washington, DC available at www.ssab.gov/NEW/Publications/Financing/estimated rate of return.pdf accessed September 9, 2004.

Written by
Thomas Hungerford,
For AARP Public Policy Institute
601 E Street, NW, Washington, DC 20049

www.aarp.org/ppi

ISSUE BRIEF

This page intentionally left blank.

Figure 1. Average Annual Real Earnings: Men and Women

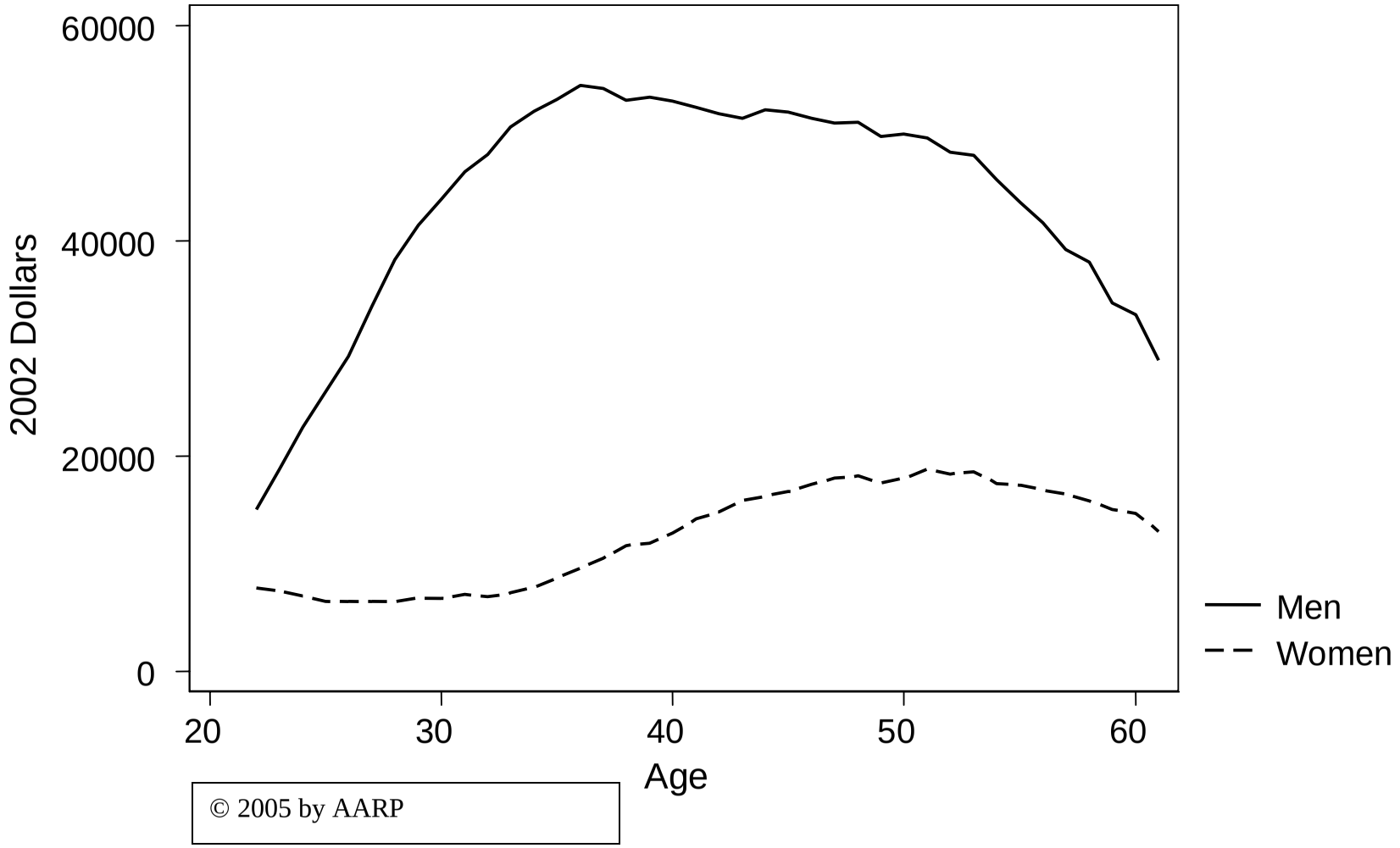


Figure 2. 40-Year Geometric Average Real Returns

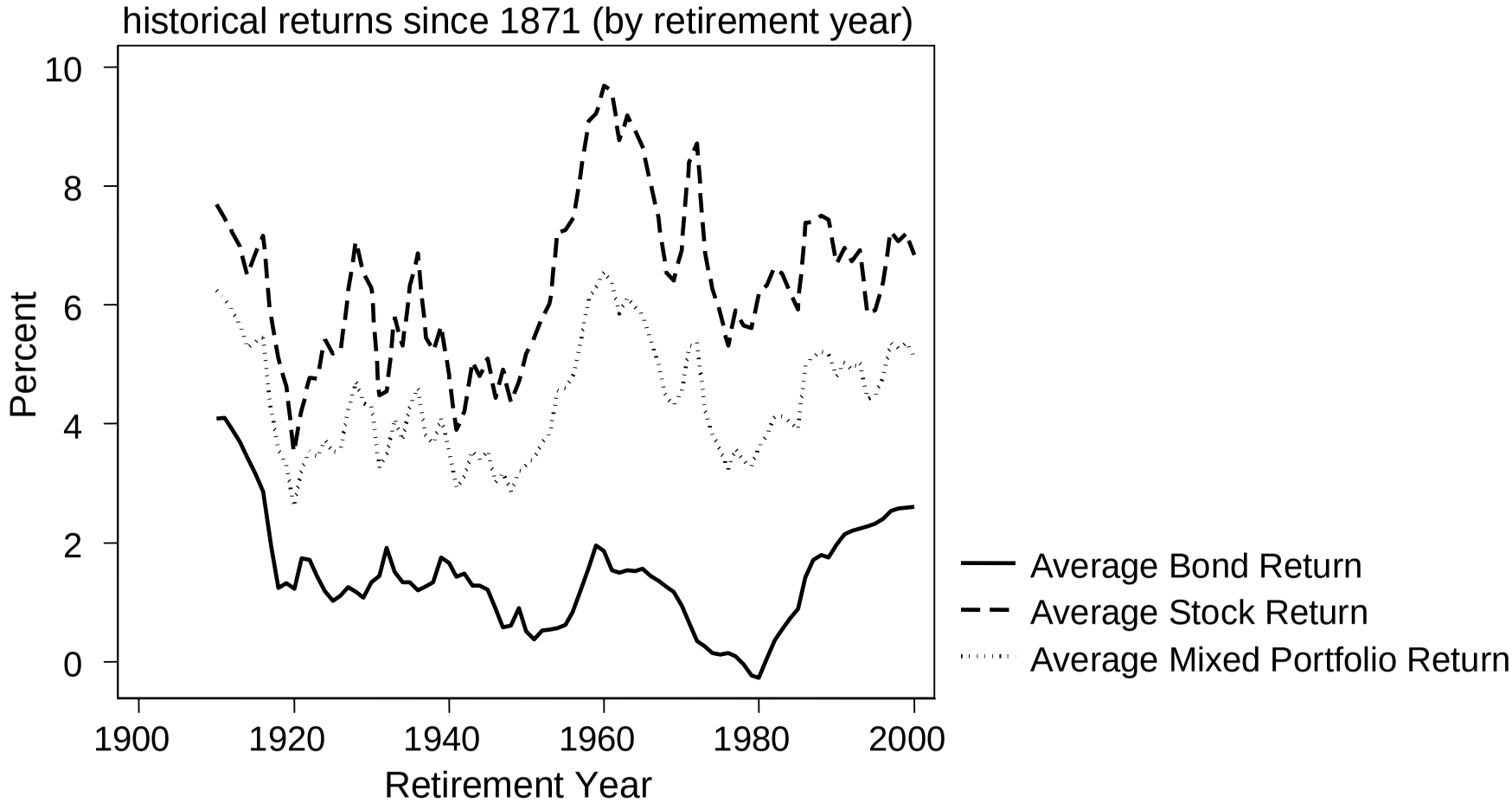
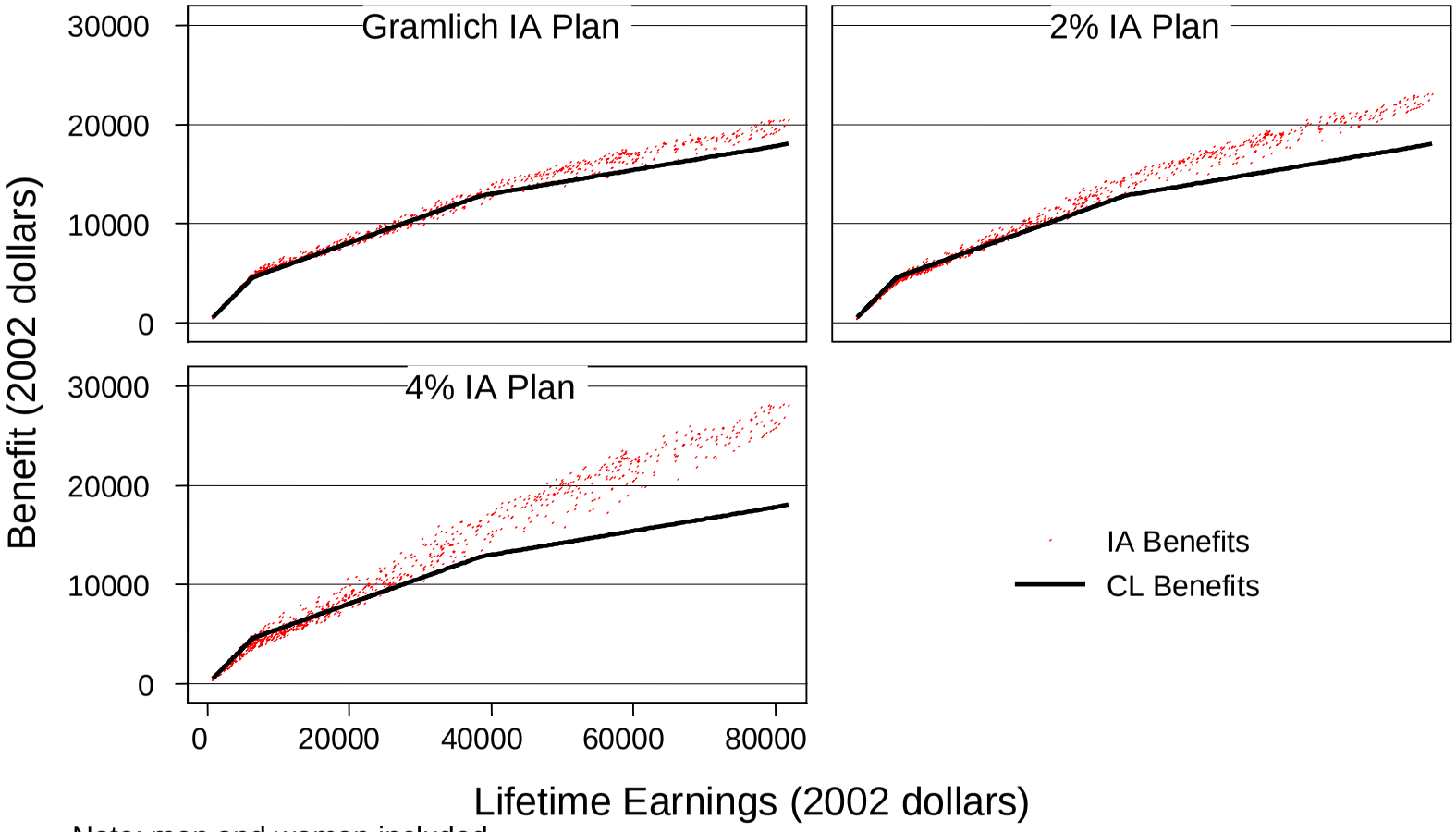
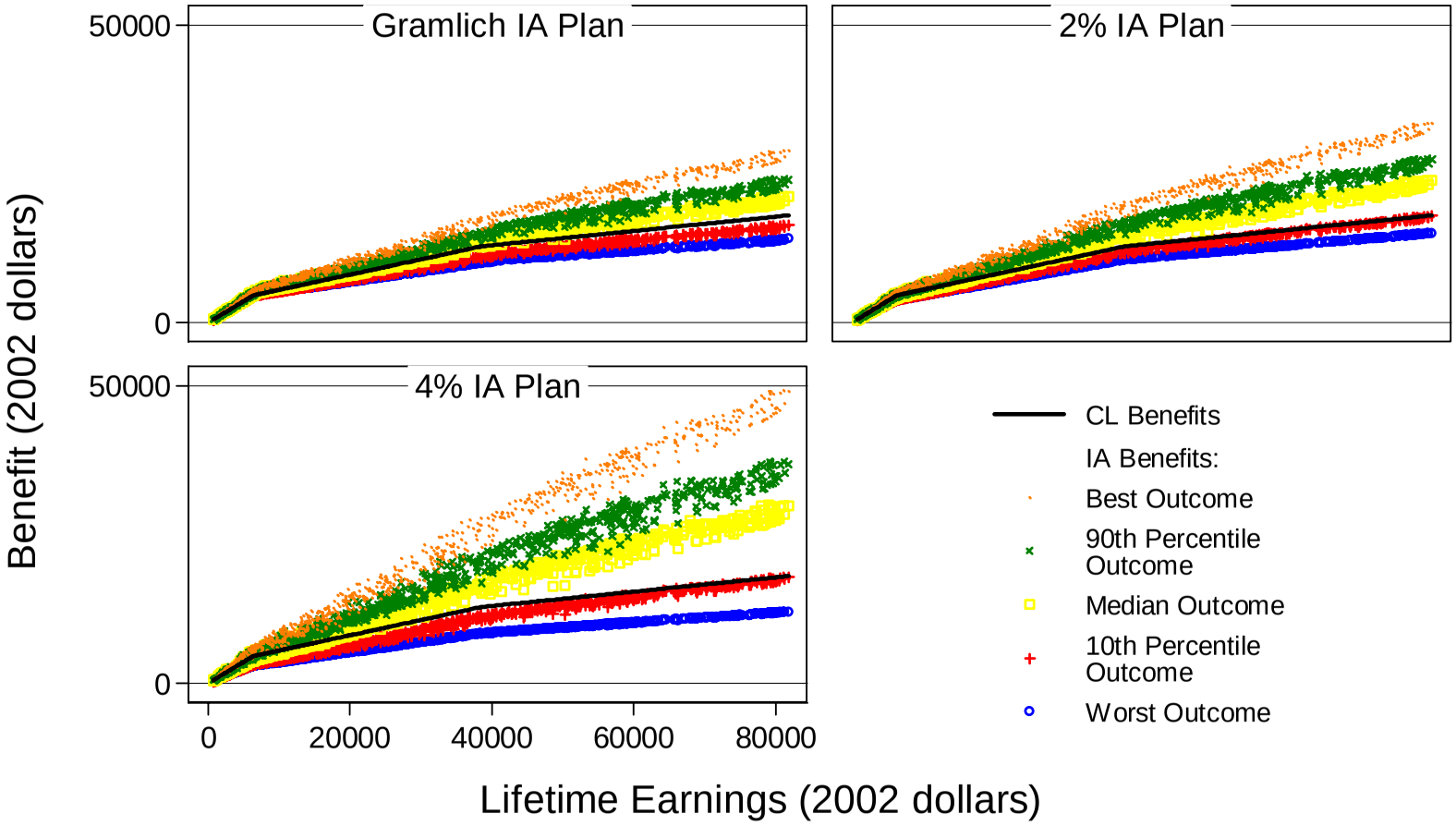


Figure 3. Outcome with Average Historical Return



Note: men and women included

Figure 4. Range of Outcomes with Historical Returns



Note: men and women included