IS FINANCIAL RISK ADEQUATELY ACCOUNTED FOR IN SOCIAL SECURITY REFORM MEASURES?

Background

The Social Security Trustees project that the U.S. Social Security program faces a long-term financing problem. The Social Security Administration's actuaries project that the trust funds will be depleted by 2042, and after that, annual tax revenues will be sufficient to cover only about 72 percent of annual expenditures.[1]

Several proposals have been offered over the past decade to shore up the finances of the U.S. Social Security program. Most of these proposals would partially privatize Social Security by creating individual retirement accounts funded with part of the payroll tax. The main idea behind these proposals is to expand advanced funding of the Social Security retirement system and to take advantage of the higher returns in the stock market.

The authors of most of these proposals claim not only that their proposals will solve the long-term financing problem, but also that future beneficiaries will be better off (or, at least, no worse off) under their new system than under the current system. Often they say such things as "workers can reasonably expect" to receive higher benefits. They then present results from distributional analyses of the effects of their plan on retirees to back up their claims.[2] The distributional analyses of many proposals, however, rely on projected asset market returns, which ignore financial risk and yield incomplete results.

Common Practice

Most authors use the postwar average market return[3] (see, for example, Feldstein and Liebman, 2002; the Social Security Advisory Council, 1997; or the President's Commission to Strengthen Social Security, 2001). Feldstein and Liebman (2002) assume that workers earn a 5.5 percent real return each year on their account balances. The Advisory Council on Social Security assumed a 7 percent real return on stocks and a 2.3 percent return for U.S. government bonds. Recently, President Bush's Commission to Strengthen Social Security assumed real returns of 6.5 percent for stocks, 3.5 percent for corporate bonds, and 3 percent for U.S. government bonds. However, using constant returns ignores the tremendous variation in asset returns over 40-year periods. Just because the average real stock return is about 7 percent today does not mean the average real return will be 7 percent over every 40-year working career.

Burtless (2000), using historical asset return data from 1871 to 1999, created 89 scenarios using asset returns from every 40-year period since 1871 (1871-1910, 1872-1911, etc.) and a stylized male worker with a 40-year earnings history. He finds "startling" variation across scenarios in

[1] The Congressional Budget Office (2004) recently projected that the Social Security Trust Fund would become depleted in 2052 after which revenues will cover 80 percent of annual expenditures.

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

[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.

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."

Many analysts, however, do perform some sensitivity analysis by simulating individual account balances with various assumed rates of return. Feldstein and Liebman (2002, p. 306), for example, simulated benefits under their stylized Social Security reform plan with a 3.5 percent real return, arguing that this is a "low probability 'pessimistic' scenario." But each analyst assumes that asset returns are the same in each and every year of the 40-year accumulation period. Even this sensitivity analysis can produce incomplete and misleading results on the range of possible outcomes. Not only is the average 40-year asset return important, but the year-to-year variation in asset returns is also important in determining how well someone does in a retirement system with individual accounts.

Incorporating Financial Risk

To show the importance of year-to-year variation in asset returns, 91 asset return scenarios were created using stock and bond returns from 1871 to 2000.[4] A 60 percent stock and 40 percent government bond portfolio is modeled. Of these 91 scenarios, five are considered in this paper, spanning the range of possible outcomes. The five were chosen by ranking the scenarios based on the geometric average return over the 40-year period, not necessarily the highest yield. The scenarios yielding the average return over the 40-year periods at the 10th percentile, the median, and the 90th percentile, as well as the lowest and highest, were selected. These scenarios are referred to as the worst (the lowest), low (the 10th percentile), median, high (the 90th percentile), and best (the highest) asset returns scenarios.

The actual annual returns as well as the 40-year geometric average return for each scenario are shown in Figure 1. In each of the five scenarios, the actual annual returns show considerable year-to-year variation over the 40-year period around the average (the horizontal line in Figure 1). In some years the return topped +30 percent and in others dipped below -20 percent. One of the differences between the worst scenario and the best scenario is the asset market returns in the last few years of the 40-year accumulation period. In the worst scenario, the return was negative in the final few years of the accumulation period; consequently, workers would see a very large loss in their account balances just before retirement. The opposite is true for the best scenario—workers would see gains in their account balances and then a small loss in the few years just prior to retirement.

The first row of Table 1 shows the specific years for the five 40-year asset return scenarios. Note that years that

[4] The historical stock and bond returns from 1871 to 2000 are used in the study. The data were kindly provided by Gary Burtless and were updated to 2000. See Burtless (2000) for the source and a description of these data. The stock market data are based on the Standard and Poor's composite stock price index while the bond data are based on U.S. government bonds with a maturity of at least 10 years. Bond returns were available only back to 1924. Treasury bond yields prior to 1924 are based on Macaulay's estimates of high quality railroad bond yields adjusted for default risk (see Burtless 2000). There are 91 consecutive 40-year periods between 1871 and 2000 which are used to create 91 scenarios. Each of the 91 stock and bond return scenarios are based on the stock and bond returns over a different 40-year period. For example, in scenario 1 the real stock and bond returns from 1871 to 1910 are used with the 40 years of earnings to create the account balance.

include the Great Depression are not necessarily associated with low 40-year average returns. The second row shows the geometric average return over the 40-year period for each scenario.

To focus solely on the effect of the patterns of real asset returns on retirement account accumulations, 10 account balances were simulated for a hypothetical worker earning a constant real $22,578 per year (the average lifetime earnings of workers in the sample). Five of the account balances were created by using a constant annual return equal to the geometric mean of real returns for the worst, low, median, high, and best scenarios. This is essentially the method most analysts use in incorporating sensitivity analysis into their distributional studies. The other five account balances were created using the actual annual asset returns for these five scenarios. The worker contributes 5 percent of annual earnings to the individual account.[5]

Simulating the 40-year account balance for this "representative" worker and assuming a constant annual stock return yields the expected one-to-one positive relationship—a higher average return is associated with a higher account balance (see the third row in Table 1). However, using the actual annual returns instead of the constant average return breaks the expected one-to-one relationship between lifetime average returns and account balances (see the fourth row in Table 1). The scenario with a 40-year average return of 6.37 percent yields a higher account balance than the one with an average return of 7.12 percent![6]

Furthermore, it appears that the account balances created with constant returns are always higher than the balances created with actual annual returns. However, when considering all 91 scenarios, there is a -26 percent to +47 percent difference between the simulated account balances using the constant average stock return and the actual yearly stock returns among these five scenarios. These results clearly show that using a constant annual return on assets in simulating individual account accumulation can and often will produce highly misleading results. Assuming constant asset returns can lead to large biases in either direction.

Furthermore, assuming constant asset returns artificially shifts the range of outcomes that could be expected from establishing individual retirement accounts. The simulated account balances from all 91 scenarios were ordered from smallest to largest. This was done separately for the balances created with actual annual returns and with the constant returns. The smallest account balance is at the first percentile and the largest is at the 100th percentile. The simulated accounts are then plotted in Figure 2. The use of constant returns shifts the range of simulated outcomes and fails to show the extent of the downside risk of investing retirement assets in stocks while overstating the upside gains.

[5] The actual contribution rate is unimportant since the same qualitative results are obtained for any constant contribution rate. The same is true for the annual earnings of the hypothetical worker.

[6] Even more astonishing, the scenario producing the largest account balance ($221,860) with actual annual returns has a geometric average return of 5.58 percent.

Conclusions

Distributional analyses of retirement systems with privatized individual accounts often assume that asset returns will be equal to the long-run average and constant from year to year. This brief has shown that this assumption leads to incomplete results, which can be misleading. The results are incomplete because the range of possible outcomes is artificially shifted. Even with sensitivity analysis, most of the financial risks associated with asset markets are assumed away, thus giving a false sense of security about the risks associated with a privatized Social Security system. Of course, this conclusion is based on the historical pattern of stock and bond returns. Future asset returns are unlikely to follow the same pattern. Nevertheless, the results do show the perils of ignoring financial risk. In order to give policymakers and the public adequate information about the desirability and feasibility of incorporating individual retirement accounts into the Social Security program, financial risks must be considered in the distributional analyses of the impacts of privatization.

References

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Table 1: Simulated 40-year Account Balances Using Historical Stock Returns with a 60 Percent Stock and 40 Percent Bond Portfolio

Scenario	Worst	Low	Median	High	Best
Years	1881-1920	1884-1923	1955-1994	1926-1965	1921-1960
Real return (geometric mean)	2.85%	3.69%	4.63%	6.37%	7.12%
40-year account balance with constant annual return	$84,677	$103,485	$130,564	$204,243	$249,120
40-year account balance with actual annual returns	$63,670	$81,686	$130,107	$202,337	$200,835
Percent difference	32.99%	26.69%	0.35%	0.94%	24.04%

Note: Based on constant annual real earnings of $22,578 and a 5.0 percent annual contribution rate to the individual account.

Figure 1. Annual and Average Returns for Five Scenarios

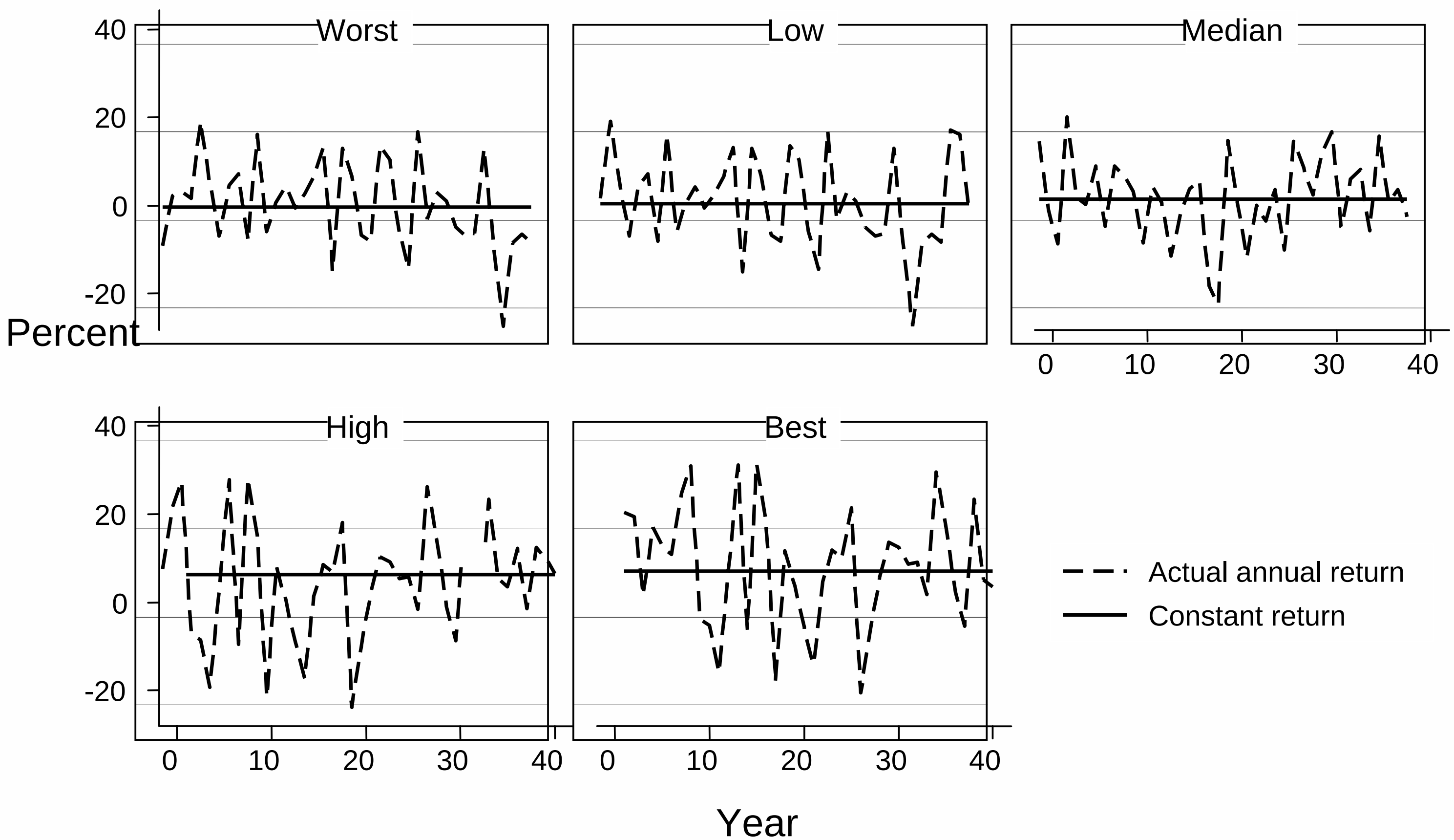

Figure 2. Simulated Account Balances

Actual Annual Returns versus Constant Returns