

Pricing Personal Account Benefit Guarantees: A Simplified Approach

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A number of proposals to introduce personal accounts to the Social Security program contain provisions that would guarantee account-holders against relatively poor investment performance that would make their total benefits fall below the level scheduled under current law. Such protections are attractive to account participants, who would benefit from the upside potential of personal accounts without the downside risk of relatively poor investment performance. However, given the size of Social Security benefit entitlements and the market risks inherent in personal account investing, guarantees constitute a significant contingent liability to whoever would be providing the guarantee.

Most of the existing research on guarantees has estimated their cost, based on a probability distribution of possible investment outcomes, and then using the distribution to calculate an “expected” cost of the minimum guarantee. While useful, this approach does not reflect fully how guarantees would be priced in the financial marketplace. In particular, it ignores the greater valuation placed by the market on losses relative to the expected value of the losses. Indeed the total “market cost” of a benefit guarantee, including the associated cost of market risk, could be several times larger than its “expected cost.” This paper demonstrates how a model for calculating the expected cost of a benefit guarantee can easily be modified to present the market-price of personal account guarantees as a supplement to expected cost valuations. The simplified method for estimating the market price of a guarantee is shown to produce results equivalent to the Black-Scholes model.

The approach is illustrated, using a Social Security reform proposal from Senator John Sununu (R-NH) and Representative Paul Ryan (R-WI). This proposal would introduce personal accounts investing from 5 to 10 percent of wages, depending upon the worker’s earnings level. At retirement, individuals would receive either the proceeds of their personal account or their currently scheduled benefit, whichever was greater. Thus, this plan effectively guarantees that accounts would produce benefits no lower than those scheduled for the current program. In the illustrative policy, the “expected cost” valuation of the proposed guarantee is calculated to be 11.3 percent of total benefits to new retirees in 2050, while the “market value” cost is calculated to be 28.2 percent of benefits.

Once an appropriate model is constructed to calculate the expected cost of a guarantee, a change of a single parameter of that model enables the analyst to calculate the risk neutral (or “market”) guarantee cost as well. While the preferred approach is to use a stochastic model to estimate the market value of the guarantee, the risk neutral price based on the analytic perspective turns out to be similar for the proposal modeled in this study. And from a practical perspective, the risk neutral guarantee costs allows for greater information to be provided to policymakers with relatively little additional research cost.

The full working paper is available on our website www.nber.org/programs/ag/rrc/books&papers.html as paper NB06-05.

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