Findings on Individual Account Guarantees

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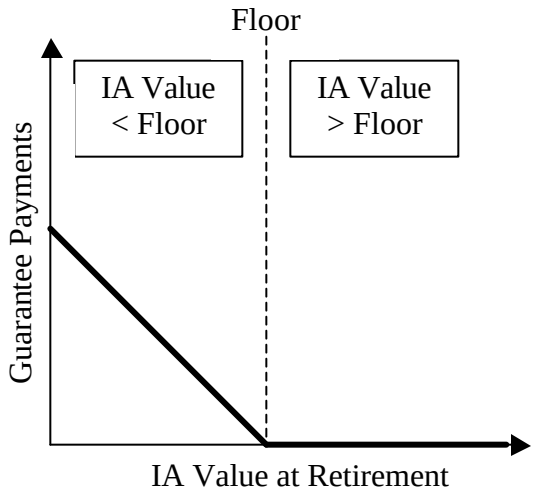
Introduction

Voluntary Individual Accounts (IAs) have been proposed as a component of a reformed U.S. social security system. IAs reduce the risk that participants currently face due to an unfunded social security system. Yet IA participants investing in financial assets would be exposed to capital market risk. Concern over financial market volatility has prompted some to propose that IA plans include a "guarantee" component. My research seeks to inform public debate by offering a technique to measure the potential costs associated with alternative guarantee structures in an IA-type social security system. I also discuss some financing issues inherent to the implementation of a guarantee.

Our longer paper on this topic[1] uses the model of guarantees illustrated in Figure 1. This model shows how an IA guarantee would work, by specifying a minimum or floor level for the account value at retirement. In this context, the retiree would receive no special payment when financial markets performed well, since the IA balance would exceed the minimum guaranteed floor. By contrast, if financial markets performed poorly and the IA value fell below the guaranteed floor, the guarantor would then be required to cover the shortfall between the floor and the participant's IA balance.

Figure 1: Individual Account Guarantee Model



[1] "Understanding Individual Account Guarantees", paper presented at the Pension Research Council Conference on "Risk Transfers and Retirement Income Security", Wharton School, April 2002 (http://prc.wharton.upenn.edu/prc/prc.html).

Finding #1: Economic Benefit Equals Economic Cost

A key result from this paper is that when an IA guarantee is economically valuable to the participant, it also has an economic cost. Some may fail to recognize these costs, since an IA guarantee might pay off relatively infrequently. Yet system designers and budget analysts must recognize the guarantee costs and identify how they can be financed.

To measure the guarantee costs, an appropriate valuation method is required. Our approach uses risk-neutral valuation, a technique widely used in modeling financial products. This model relies on the same no-arbitrage arguments that are used to derive the popular Black-Scholes formula. Put simply, the method computes the market value of the guarantee, which is the price that financial intermediaries would require in exchange for taking on the IA guarantee commitment.

To illustrate guarantee costs, a reasonable set of assumptions is used. Table 1 indicates potential guarantee costs for a "base case" scenario where the guarantee is a 10-year Treasury bond return: that is, the participant would be promised that his IA would earn at least the rate of return that a 10-year Treasury bond fund would have paid. In the base case, we also assume that the participant's investment horizon is 40 years, and his IA portfolio is invested half in stocks and half in bonds. Guarantee costs are reported as a percentage of the participant's lifetime IA contributions. In the base case example, a guarantee cost of 16.1% implies that for every $1000 devoted to the IA, an additional $161 would be required to cover guarantee costs.

Table 1: Cost Estimates (as a % of contributions)

Base Case • Guarantee Design: 10-year Treasury bond guarantee • Investment Horizon: 40 years • Investment Portfolio: 50% stocks and 50% bonds	**16.1%**
All else constant but:	
Change Guarantee Design to a Principal Guarantee	0.0%
Change Investment Horizon to 10 years	8.1%
Change Investment Portfolio to 100% stocks	31.3%

Finding #2: Guarantee Design Matters

Table 1 shows that the structure of the guarantee has a powerful effect on guarantee costs. For instance, promising a Treasury bond return is quite expensive, but costs are negligible for a principal guarantee; the latter provides the participant with the guaranteed return of his contributions without interest. A principal guarantee might seem attractive, though its tiny cost also means that negligible economic benefit is provided to the participant. Of course, policymakers will need to evaluate the trade off between the level of protection a guarantee provides to IA plan participants and its associated cost.

Finding #3: A Longer Investment Horizon Does Not Eliminate Guarantee Costs

Another result identified in Table 1 is the fact that having a longer investment horizon does not necessarily drive guarantee costs down. Financial advisers often claim that "stocks are less risky over a longer investment horizon," but this does not imply IA guarantee costs would fall over time. Indeed, Table 1 shows that as the investment horizon is extended from 10 to 40 years, guarantee costs double (from 8.1% to 16.1% of annual contributions). This perhaps surprising result is due to the fact that the guarantee calculation uses compounded rather than annualized returns. The claim that "stocks are less risky over a longer investment horizon" is in fact related to annualized stocks returns and should not influence guarantee costs. What really matters is the volatility of compounded returns, which increases over time and drives the guarantee costs up.

Finding #4: Investment Flexibility Increases Guarantee Costs

It would be risky, and costly, to give IA participants a guarantee without imposing any restriction on their portfolio allocation. This is because of moral hazard: they would be more likely to select riskier investments since they would benefit from the upside potential of risky investments, while the downside risk would be (partially) assumed by the guarantor.

The relationship between portfolio risk and guarantee costs is illustrated in Table 1, where we show that moving from half to all equities in the IA almost doubles

guarantee costs (from 16.1% to 31.3% of annual contributions). Hence, guarantee providers will likely require some restriction on portfolio investments to keep guarantee costs down.

Further Research Needs

This research shows that Individual Account guarantees that provide economic value are not free. Furthermore, they may be more costly than intuition would suggest. In addition to showing potential guarantee costs, this research also raises issues regarding alternative financing approaches for IA guarantees. For example, if participants were allowed to select a guaranteed investment product from among several investment choices, they might be asked to pay for the costs directly; alternatively some sort of subsidy might be deemed appropriate. Future research is needed to evaluate participants' willingness to pay for these guarantees. Additional research is also required to show how guarantors might finance the guarantees using derivative strategies and to verify whether these strategies could be implemented effectively.