Market versus Self Insurance of Longevity Risk

Empirical studies of demography in the OECD countries show that the decline in mortality adheres to the Monotone Probability Ratio Order criterion (introduced by Eeckhoudt and Gollier, 1995). According to this criterion, the ratio of changes in mortality along time decreases with age (Machnes, 2003). This trend shows that pooling the liabilities of annuities and life insurance contracts can protect their providers from longevity risks but, as most of the financial institutions act separately in these insurance branches, pooling arrangements require a market.

Managers of insurance companies and pension funds try to avoid volatility in their accounting reports, but before applying to the capital markets, pension funds need to protect their balance sheet by immunizing their bonds according to the life expectancy of their insured clients and holding assets that are positively correlated with longevity, such as shares of pharmaceuticals, long term home-care ownership etc. Holding shares of life insurance companies does not always contribute positively. The decline in mortality in the last decade was not enough to prevent losses for many life insurers. Other changes in the financial markets including fluctuating interest rates and competition hurt insurers and were followed by mergers and acquisitions that decreased the number of life insurers. Applying to the capital markets for re-insurance of longevity risks can be done in the case of risks that are anticipated for the near future and cannot be hedged by assets.

This study analyzes the optimal welfare of an individual who has to choose a pension plan as part of his/her employment contract or country regulations. It has been shown (Machnes, 1978) that pooling independent risks by a group of individuals is Pareto optimal and is in the core of the economy. But in the real world, there are transaction

costs in pension plans and the loading factor reduces the size of the optimal insurance coverage (Davidoff, Brown and Diamond, 2005). Usually, a pension plan provides benefits up to 70% of the worker's average salary over time. Empirical surveys have not found individuals who voluntarily bought an annuity in addition to their pension plan. On the other hand, many members of pension funds cash in their benefits when they retire, although the present value of future benefits is based on a relatively high discount rate, assuming that the health status and life expectancy of these members is relatively low, leaving the healthier members behind in the fund.

Individuals also face background risks in several dimensions including their own health and that of their spouse and children, medical expenditures and the purchasing power of their future nominal income. Most of them have bequest motives and want to leave assets after their death. All these factors influence their demand for annuities. In fact, studies of individuals' preferences show that partial insurance coverage of their old age income is optimal and thus a participating pension plan should be suggested to them. In this plan there are no defined benefits (DB) and the pension depends on the returns from their accumulated contributions and the future national life expectancy projections estimated by an official institute. Individuals can move their accumulated contributions from one pension fund to another to assure competition among the pension funds. Defining the pension benefits on retirement for each age cohort can be done by immunization of bonds and re-insurance of longevity risk but these arrangements through the capital markets will reduce benefits. The pension fund should suggest to its insured members to choose the contract they prefer.

Participating pension plans reduce the uncertainty that pension funds face and increase the expected value of pensions. Designing a pension plan with DB, both for newcomers and pensioners will allow individuals to compare and choose the plan they prefer. It is important for the members of the pension fund to be involved in the choice of their plan and be aware of the cost of longevity re-insurance and the guaranteed rate of returns. Presenting alternative pension plans to individuals will let them optimize their welfare and can eliminate the principal-agent gap. When sharing the longevity risk with members of the pension fund who are willing to participate in risk, the demand by the pension funds for longevity re-insurance reflects the risk aversion of its members and not of their managers.

The actuarial deficits of the existing pension funds that already promised DB when mortality rates and returns to assets were relatively high is mainly a social and political problem. Governments should decide whether to help these funds by imposing their deficits on the younger generations or by establishing a legal solution that will cut down the pension defined benefits.

References

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