

Turning an Asset-Liability Management problem into a portfolio selection problem

March 11, 2012

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Abstract

One of the fundamental questions in finance is how to select an investment portfolio? The most popular model is the Mean-Variance (MV) model that was presented by Markowitz in 1952. In the MV model, the optimization problem is a constrained quadratic functional. Another model, for example, is presented in Landsman (2008) where an explicit solution is obtained for the problem of minimizing the root of a quadratic functional subject to a linear constraint, which is the Mean-STD model. In actuarial science we consider an Asset-Liability Management problem (ALM). In this problem we are looking for an investment portfolio that will cover the liabilities. Although that in both of the problems the aim is to find an optimal investment portfolio, the analysis of the ALM is usually more complicated. The optimal solution to the mean-variance ALM problem is obtained by transferring the problem into the classical MV optimization problem, see Panjer et al. (2001). In this paper we show a general technique to transfer the ALM problem into a standard investment portfolio problem and we implement it in some other models.

Keywords: Portfolio selection in insurance, Asset-Liability Management, Optimization problems in insurance

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