Title: Dynamic Pension Funding Models

Author : Dalia Khalil,
Affiliation : City University, London, UK

Abstract

Achieving an adequate income in the old age to maintain the standard level of living after retirement has been a challenge to pension schemes for a long time. In fact, approaching this goal has led to a global pension crisis considering all the economic and demographic changes and the conflicting interests of employers and employees over time. This research aims to deriving different deterministic and stochastic dynamic pension funding models for defined benefit schemes within the mathematical framework of optimal control theory and dynamic programming. The practical implementation of these dynamic models into one of the largest Egyptian defined benefit occupational pension schemes - as a case study – is a tool to examine how they act in the reality and provide the management of the pension fund with a dynamic plan instead of the static ones that have been used in such a volatile market. Also, reaching the optimal contribution rate taking into consideration the mutual interests of both the employer and the employees by including a mixed middle term in the dynamic pension funding models. This represents both the contribution rate risk and the solvency risk and could provide a solution for one of the pension schemes problems.