

Pension Planning and Investments Under Transaction Costs

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Abstract

We study how the illiquidity of a pension fund affects the allocation of an individual's wealth between the pension fund itself and a frictionless financial market. To recover money from a pension fund is generally expensive or even impossible, and this may cause serious liquidity problems if individual's special needs arise. This could explain the thinness of the annuity market despite the fact that annuity's returns are in average higher than the ones provided by the financial market. We implement a life-cycle model of savings and consumption. During the working age the individual receives a stochastic income and she/he has to decide the level of the voluntary contribution to a pension savings account. The contribution is costless, whereas withdrawals are charged by a proportional cost. At retirement the fund accumulated in the pension account is converted into a fixed immediate riskless annuity, and the individual may continue to invest in the financial market.

The Markovian structure of the model enables us to split the analysis into two different sub-problems: pre-retirement and post-retirement problem. The latter is an infinite horizon Merton's type consumption/investment problem enriched with the time dependent demographic aspect. We completely solve this problem and explicit solutions for the optimal strategies are provided. The pre-retirement is a finite horizon consumption/investment problem with transaction costs on the pension savings account but not on the financial market; demographic uncertainty as well as stochastic income are others distinguishable features of this sub-problem. We prove several properties of value function and its characterization as the unique viscosity solution of the HJB equation associated to the problem.