


复旦大学数学科学学院

数学综合报告会

报告题目：Optimal asset allocation for a household with multi-claim insurance

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时间：2026-01-07 星期三 14:00-15:00

地点：光华楼东主楼 1801

报告摘要：

We examine the optimal consumption, investment, and insurance strategies in a framework where a household purchases multi-claim insurance for the wage earner. Unlike traditional short-term life insurance, this whole-life coverage includes payments not only upon the insured's death but also in the event of illness. Importantly, we allow coverage to increase at any time and by any amount before illness, introducing singular control into the optimization problem. Using dynamic programming, we transform the problem into a two-stage optimization framework divided by the health state of the wage earner, obtaining the Hamilton--Jacobi--Bellman equations. Insurance strategy is determined only in the first period, while consumption and investment should be considered in both periods. For the constant absolute risk aversion utility function (CARA), we derive closed-form solutions for this nested stochastic control problem and demonstrate that the optimal insurance decision is a barrier strategy. Comparing one-claim and multi-claim scenarios, we highlight the distinct effects of multi-claim coverage on financial strategies. Numerical examples are provided to illustrate the practical implications and findings between the two cases.

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