The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Utility maximization in incomplete markets

by

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Abstract

A fundamental problem of mathematical finance is that of an economic agent who invests in a financial market so as to maximize the expected utility. In a continuous-time framework, the problem was studied for the first time by Merton (1969), who derived a nonlinear partial differential equation (Bellman equation) for the value function of the optimization problem and produced a closed-form solution for the power, logarithmic, and exponential utility functions. The modern approach to the problem of expected utility maximization is based on duality, which makes it possible to substantially relax the conditions on the utility function and the model of the market, such as the requirement of Markov state processes.

In this presentation, we will consider Merton's portfolio problem in various formulations and methods of solutions. We will also describe several no-arbitrage conditions and the validity of the key assertions of the utility maximization theory under them. Finally, we will provide an explicit second-order expansion formula for the power investor's value function seen as a function of the underlying market price of risk process and a derivative of the optimal wealth process.

Date :   12 May, 2016 (Thursday)
Time :   3:00 pm--4:00 pm
Venue : Y306, The Hong Kong Polytechnic University

* * *   ALL ARE WELCOME   * * *