Actuarial Science: Special Colloquium
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Title: A Least-Squares Monte Carlo Approach to the Calculation of Capital Requirements

Abstract: The calculation of capital requirements for financial institutions usually entails a reevaluation of the company’s assets and liabilities at some future point in time for a (large) number of stochastic forecasts of economic and firm-specific variables. The complexity of this nested valuation problem leads many companies to struggle with the implementation. Relying on a well-known method for pricing non-European derivatives, the current paper proposes and analyzes a novel approach to this computational problem based on least-squares regression and Monte Carlo simulations. We study convergence of the algorithm and analyze the resulting estimate for practically important risk measures. Moreover, we address the problem of how to choose the regressors, and show that an optimal choice is given by the left singular functions of the corresponding valuation operator. Our numerical examples demonstrate that the algorithm can produce accurate results at relatively low computational costs, particularly when relying on the optimal basis functions.

Location C405 Wells Hall
Time 10:30-11:20 am, Thursday Nov 12, 2015