Universität Trier

Mathematisches Kolloquium

Im Rahmen des Mathematischen Kolloquiums findet am

Donnerstag, 2. Juli 2015
16 h c.t.
Hörsaal 9

folgender Vortrag statt:

New results on replicating portfolios

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Abstract

We consider the most popular approaches for the construction of replicating portfolios for life insurance liabilities known as cash flow matching and terminal value matching. Solutions to these quadratic optimization problems are derived analytically and a detailed comparison is provided. It is shown that the (unique) solutions have fair value equal to the fair value of liabilities. Then, the problems are generalized by relaxing the requirement of static replication to allow for dynamic investment strategies in a numeraire asset with zero present value. A relationship between the solutions to these generalized problems is established, which sheds new light on the relation of the original problems. We will pay special attention to one specific problem instance which can be interpreted as a stochastic version of the Fermat-Torricelli problem. Finally, it is proved that the fair values of the optimal solutions to the generalized problems remain equal to the fair value of liabilities. Based on numerical examples it is shown that the dynamic investment strategies can be reasonably approximated by linear regression, such that an out-of-sample implementation, as e.g. needed for MCEV and Solvency II calculations, is possible.

If time allows, we also present several consistency properties derived by continuity results from parametric optimization. We further obtain asymptotic convergence rates which improve upon standard results from stochastic optimization.

This is joint work with Jan Natolski (Augsburg University)

Gastgeber:
Prof. Dr. Mirjam Dür

Ab 15.45 wird im E 10 Kaffee/Tee und Gebäck gereicht.