Mathematical Aspects of the Bond Market

Jerzy Zabczyk

Institute of Mathematics, Polish Academy of Sciences

Bond prices and forward rates can be modelled as stochastic processes in function spaces, in particular as solutions to stochastic partial differential equations. Such modelling leads to questions of existence, uniqueness, positivity and asymptotic behaviour of the solutions to specific SPDs.

In the talk those questions are discussed for the so called Heath-Jarrow-Morton-Musiela equation when the stochastic factor is a general Lévy process. In the special case, when the diffusion coefficient is a linear functional of the forward curve, the obtained characterizations are close to necessary and sufficient conditions.

The talk is based on the following publications:

Barski, M. and Zabczyk, J. (2012). Heath-Jarrow-Morton-Musiela equation with Lévy perturbation. *J. Differential Equations,* **253**, 2657–2697.

Rusinek, A. (2010). Mean reversion for HJMM forward rate models. *Adv. in Appl. Probab.,* **42**, 371–391.

Peszat, S. and Zabczyk, J. (2007). *Stochastic Partial Differential Equations with Lévy Noise.* Cambridge University Press.