Quantitative Finance > Pricing of Securities

Jump-diffusion modeling in emission markets

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Mandatory emission trading schemes are being established around the world. Participants of such market schemes are always exposed to risks. This leads to the creation of an accompanying market for emission-linked derivatives. To evaluate the fair prices of such financial products, one needs appropriate models for the evolution of the underlying assets, emission allowance certificates. In this paper, we discuss continuous time diffusion and jump-diffusion models, the latter enabling one to model information shocks that cause jumps in allowance prices. We show that the resulting martingale dynamics can be described in terms of non-linear partial differential and integro-differential equations and use a finite difference method to investigate numerical properties of their discretizations. The results are illustrated by a small numerical study.

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