Pricing two-asset Barrier Options under Stochastic Correlation via Perturbation

Abstract:
The correlation structure is crucial when pricing multi-asset products, in particular barrier options. In this work we price two-asset path-dependent derivatives by means of perturbation theory in the context of a bi-dimensional asset model with stochastic correlation and volatilities. To our best knowledge, this is the first attempt at pricing barriers with stochastic correlation. It turns out that the leading term of the approximation corresponds to a constant covariance Black-Scholes type price with correction terms adjusting for stochastic volatility and stochastic correlation effects. The practicability of the presented method is illustrated by some numerical implementations.

Stichworte:
multivariate asset price model, stochastic correlation, perturbation theory, barrier derivatives pricing

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