An EPMS Price Estimator for Multi-Asset Financial Derivatives

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Abstract

This article considers the empirical *P*-martingale simulation (EPMS) price estimator of multi-asset financial derivatives. The corresponding change of measure process of a stochastic model is derived by the multiple dimensional Girsanov theorem or Esscher transform. For Lipschitz continuous or generic Lipschitz continuous payoff functions, the consistency of the proposed EPMS price estimator is established. In simulation study, geometric average put and maximum call options are considered under multidimensional geometric Brownian motion or GARCH models. Numerical results indicate that the proposed price estimator is accurate and is capable of improving the efficiency of traditional Monte Carlo price estimator.

Keywords: Empirical *P*-martingale simulation; Esscher transform; GARCH model; Multi-asset derivatives pricing.