

Asymptotic Distribution of the EPMS Estimator for Financial Derivatives Pricing

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Abstract

The empirical P -martingale simulation (EPMS) is a new simulation technique to improve the simulation efficiency for derivatives pricing when a risk-neutral model is not conveniently obtained. However, since the EPMS estimator creates dependence among sample paths to reduce its estimation variance, the corresponding standard error is not available from using only one simulation path. The asymptotic normality of the EPMS estimator is derived for piecewise smooth payoffs, which could be either continuous or discontinuous. Simulation results indicate that the asymptotic distribution serves as a persuasive approximation for samples consisting of as few as 500 simulation paths, which helps to reduce the computational costs. This is a joint work with Ms. Ya-Ting Tu.

Key words and phrases: empirical P -martingale simulation, Monte Carlo simulation, option pricing.