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Antithetic variates in Asian options pricing: a numerical investigation

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Abstract

Asian options are a type of financial derivative constructed for assets with low liquidity (that are thus susceptible to price manipulation), such as crude oil. Depending on the averaging type they use in the payoff function, they may or may not have closed-form solutions for their prices. In this thesis, I examine the latter case (Monte Carlo simulation – MC) and a technique which reduces variance (Antithetic Variates – AV). I find that the use of the variance reduction is not justified by the stock distribution created by the two approaches, but rather by descriptive statistics of the two samples. Finally, I examine the rate of convergence for AV and pinpoint when its use is more effective than MC.

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