Case Studies in Financial Modeling: Jim Gatheral Homework 5

Comparing Stochastic and Local Volatility Pricing of Lookback Options

Using your stochastic volatility and local volatility Monte Carlo codes from Homework 3, price a one year at-the-money lookback call that is monitored once a day (assume 252 working days in a year). Use the same parameters as in Homework 3 – namely:

$$
\begin{aligned}
v &= 0.04 \\
\bar{v} &= 0.04 \\
\lambda &= 10 \\
\eta &= 1 \\
\rho &= -1
\end{aligned}
$$

Intuition

What is the intuition behind the difference in price in the two cases? Appeal to the dynamics of the implied volatility skew in your answer.