

Series 10

Introduction to Computational Finance

return no later than May 12th 2020 at 8:00

The Greeks

Like in the series 9, let an asset S be valued at $t = 0$. Let be a put option having maturity $T = 1$ and strike price $K = 120$. The volatility is assumed to be constant ($\sigma = 20\%$) over the lifespan of the put; the risk-free rate is $r = 5\%$; the put is an European option.

Using the Black-Scholes formula to value the put price:

- Plot the evolution of the put price as a function of the initial asset price S_0 .
- Plot the Δ for this put.
- Plot the Γ for this put.
- Comment the graphs.

Suppose that the asset price is $S_0 = 100$, and we sell 1000 puts.

- We want be Δ -neutralized, which position should we have?
- Suppose $S_{0+\epsilon} = 105$, what is the payoff of this strategy?
- And for $S_{0+\epsilon} = 95$?

Report

Each student is expected to give back a personal work consisting of a report in PDF format presenting his/her results and answering the questions of the exercise, as well as the script used to generate the presented results. Both report and script have to be uploaded on Moodle (IFC/Series10).