CREDIT SUISSE

Lecture 5: Introduction to Option Pricing

1) Implement Black-Scholes formulas for option prices and deltas (in any programming language or spreadsheet). Prepare a short report:

    a. Check your implementation: verify that the difference of the deltas for put and call for the same stock price (S) is 1 (for call – put) and the difference of their values is $S - K$ (put-call parity).

    b. In a spreadsheet, plot **values** of a **call** option (on one chart) as a function of stock price:
        - for different times to maturity: 0.001 (almost at expiry), 0.5 and 1 year, for volatility being 10%
        - include spots "left from" and "right to" the option strike ($0 < S_L < K < S_H$)

    c. Repeat point b. for **values** of a **put** option

    d. Repeat point b. for **deltas** of a **call** option

    e. Repeat point b. for **deltas** of a **put** option

2) Repeat exercises 1b. and 1d. for a different volatility level (20%). What has changed compared to the case where $\sigma = 10\%$ and why?

3) How would you calculate a value of a contract paying 1 unit of cash, if stock price on maturity is above some level K (i.e. $S_T > K$), 0 otherwise. Explain your reasoning.