

Mathematical Finance 2

Exercise sheet 12/13

Please prepare Exercise 3 of Exercise Sheet 11.

1. The holder of a *forward-start option* receives at time T_0 an option with maturity $T > T_0$ and strike KS_{T_0} for some $K > 0$. Compute the price of a *forward-start call* at time $t = 0$ in the Black-Scholes model.

2. Consider a *gap call* with payoff

$$H(S_T) = (S_T - L)1_{\{S_T > K\}},$$

where $K, L \geq 0$. Draw the payoff function. For which values of K and L does it take negative values? Use the risk neutral pricing formula to find the price and the hedging strategy in the Black-Scholes model.

3. Solve Exercise 6.9 in Shreve's book.
4. Solve Exercise 6.10 in Shreve's book.