Homework 3

Deadline: 8 October 2025, 23:45.
All solutions must be in a single PDF file and uploaded to the LMS portal.

1. Consider a structured deposit - a financial product that offers fixed income and additional yield in the form of a call option. The underlying asset of the call option is asset S. The guaranteed income pays an amount S_0 at maturity of the deposit. Assume the funding rate is higher than the model rate.
   (a) (0.5 point) Is it true that the funding component is always positive?
   (b) (0.5 point) Is it true that the funding component is always negative?
2. (1 point) Describe a hedging strategy that replicates the payoff of a call option under a non-zero constant interest rate, for continuous paths crossing the strike price finitely many times.
3. (1 point) Consider a naive hedging strategy for an option with a certain strike price, assuming the underlying asset price follows a Brownian motion. Compute the ratio of the standard deviation of the hedging error to the premium of a zero-strike option. Assume zero interest rates.