

UNIVERSITY OF TEXAS AT AUSTIN

Problem set #5

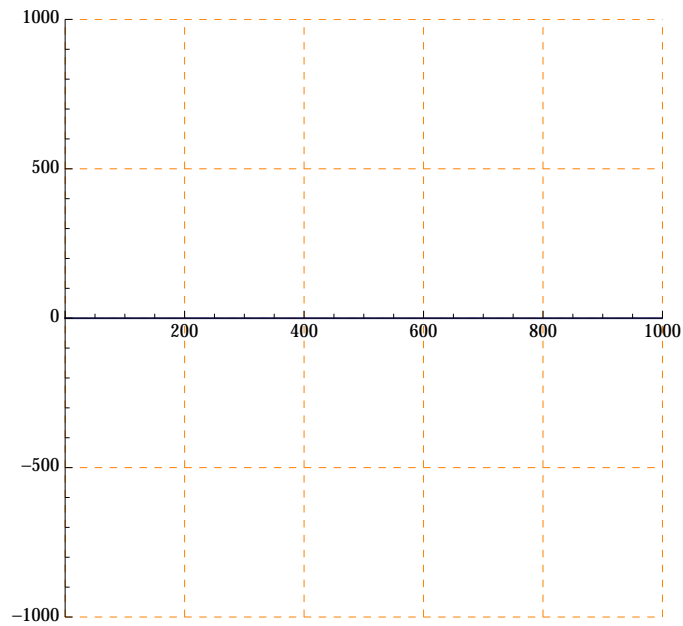
Hedging using European call options: Caps.

5.1. Buyer hedging with a European call.

Problem 5.1. Recall that a buyer of commodity has an inherent **short** position in that asset. If (s)he decides to use European calls to hedge, should (s)he buy or write the call option?

Solution: Long/buy.

Problem 5.2. Suppose that the buyer is hedging using a European call. Draw the payoff curve of the hedged portfolio.



Problem 5.3. The “Babkas, Brownies and Beyond” bakery sells blueberry muffins for \$3.00 per muffin. The bakery will need to buy 100 lbs of blueberries in six months to produce the 1600 muffins needed for the “Greater Springfield Blueberry Jamboree”. Non-blueberry costs total \$2,500. Assume that the continuously compounded risk-free interest rate equals 0.04. Local farmers are financially sophisticated. Our bakery uses one hundred \$1.60-strike, six-month call options (each on a pound of blueberries) to hedge against rising prices of blueberries. The calls can be bought for \$0.15 per call. Assume that the market price of a pound of blueberries is \$1.65 in six months. What is the profit of the bakery’s hedged portfolio?

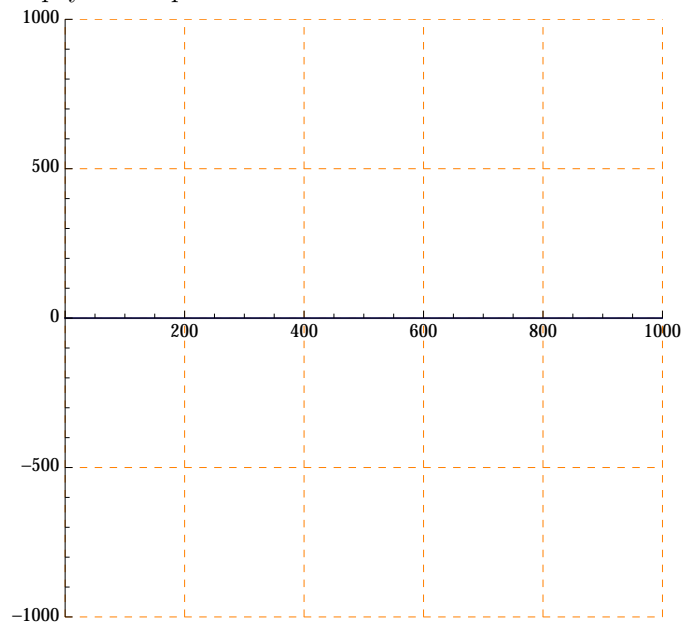
Solution: See our lecture notes.

5.1.1. *The short seller's perspective.*

Problem 5.4. Look at the following situation:

- the initial stock price is $S(0) = 100$; the short seller receives the proceeds of the short sale at time $t=0$;
- the continuously compounded risk-free interest rate equals 0.04;
- the short sale is closed at time $T = 1$;
- a 100-strike, one-year European call on the stock is sold for \$5 at time $t=0$.

What are the short seller's payoff and profit curves?



Solution: See our lecture notes.