Derivative Instruments Paris Dauphine University - Master IEF (272)

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Exercises Chapter 9

Exercise 1 What is a lower bound for the price of a four-month call option on a non-dividend-paying stock when the stock price is \$28, the strike price is \$25, and the risk-free interest rate is 8% per annum?

Exercise 2 The price of a non-dividend paying stock is \$19 and the price of a three-month European call option on the stock with a strike price of \$20 is \$1. The risk-free rate is 4% per annum.

What is the price of a three-month European put option with a strike price of \$20?

Exercise 3 What is a lower bound for the price of a two-month European put option on a non-dividend- paying stock when the stock price is \$58, the strike price is \$65, and the risk-free interest rate is 5%per annum?

Exercise 4 A one-month European put option on a non-dividend-paying stock is currently selling for \$2.50.

The stock price is \$47, the strike price is \$50, and the risk-free interest rate is 6% per annum. What opportunities are there for an arbitrageur?

Exercise 5 (Done) The price of a European call that expires in six months and has a strike price of \$30 is \$2.

The underlying stock price is \$29, and a dividend of \$0.50 is expected in two months and again in five months.

The term structure is flat, with all risk-free interest rates being 10%.

What is the price of a European put option that expires in six months and has a strike price of \$30?

Exercise 6 (Done) The price of an American call on a non-dividend-paying stock is \$4.

The stock price is \$31, the strike price is \$30, and the expiration date is in three months. The risk-free interest rate is 8%.

Derive upper and lower bounds for the price of an American put on the same stock with the same strike price and expiration date.

Exercise 7 Prove the Proposition of slide 24. (Hint: For the first part of the relationship consider (a) a portfolio consisting of a European call plus an amount of cash equal to K and (b) a portfolio consisting of an American put option plus one share.)