



LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

Corporate Investment Appraisal

Masters in Finance

2016-2017

Fall Semester

Clara C Raposo

Problem Set 3: Valuation of Financial Options

HAND IN SOLUTIONS – Class of OCTOBER 12TH 2016

1. The annual volatility of the return of company CJRD's stock is 30%. Currently CJRD's stock price is €3.25. The risk-free interest rate is 1% *per annum* (continuous).
 - (a) Compute the risk neutral probability of the scenario “up” in the context of the binomial model (1 year time step).
 - (b) What is the value of a European call option on a share of company CJRD, with a strike price of €4.00 and time to maturity of 1 year? Use the binomial model (1 year time step).
 - (c) Estimate the value of a put option on a share of company CJ, with expiry date in 2 years' time and an exercise price of €4.25 (use the binomial model, with time steps of length $dt=1$ year).
2. The shares of firm MC have an annual volatility of 20% and are currently priced at \$4.0. There is no expectation of a dividend in the coming year. The riskless annual interest rate is 1% (continuous).
 - (a) What is the value (BS) of a call option on share of firm MC, for a maturity of 1 year and an exercise price of \$4.5?
 - (b) What is the value (BS) of a European put option on a share of Firm MC, with expiry date in 9 months time, and with an exercise price of \$4.5?
3. Consider again the data of problem 1, regarding company CJRD: The annual stock volatility is 30% and the stock price is currently €3.25. No dividend is expected for the coming year. The riskless annual interest rate is 1% (continuous).

Re-compute the value of a call option with maturity of 1 year, with an exercise price of €4.00, based on the binomial model, considering time intervals of two months (each branch is 2 months long).