LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

Corporate Investment Appraisal

Masters in Finance

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Fall Semester

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Problem Set 3: Valuation of Financial Options

HAND IN SOLUTIONS – DEADLINE: OCTOBER 9TH 2017, 12:00

1. The annual volatility of the return of company CJRD's stock is 45%. Currently CJRD's stock price is €3.75. The risk-free interest rate is 1.5% *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 €4.25 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 3 years' time and an exercise price of €4.50 (use the binomial model, with time steps of length dt=1 year).

2. The shares of firm MC have an annual volatility of 35% and are currently priced at $40. There is no expectation of a dividend in the coming year. The riskless annual interest rate is 1.5% (continuous).

(a) What is the value (BS) of a call option on share of firm MC, for a maturity of 18 months and an exercise price of $45?

(b) What is the value (BS) of a European put option on a share of Firm MC, with expiry date in 3 years' time, and with an exercise price of $45?

3. Consider again the data of problem 1, regarding company CJRD: The annual stock volatility is 45% and the stock price is currently €3.75. No dividend is expected for the coming year. The riskless annual interest rate is 1.5% (continuous).

Re-compute the value of a call option with maturity of 1 year, with an exercise price of €4.25, based on the binomial model, considering time intervals of 1 month (each branch is 1 month long).