Corporate Investment Appraisal

Masters in Finance

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Problem Set 3: Valuation of Financial Options

1. The annual volatility of the return of company CJ's stock is 40%. Currently CJ's stock price is €4.25. The risk-free interest rate is 2% 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 CJ, with a strike price of €5.2 and time to maturity of 1 year? Use the binomial model.

(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 €5.0.

2. The shares of firm MC have an annual volatility of 30% and are currently priced at $5.0. There is no expectation of a dividend in the coming year. The riskless annual interest rate is 3% (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 $6.5?

(b) What is the value (BS) of a European put option on a share of Firm MC, with expiry date in 5 months time, and with an exercise price of $6.5?

3. Consider again the data of problem 1, regarding company CJ: The annual stock volatility is 40% and the stock price is currently €4.25. No dividend is expected for the coming year. The riskless annual interest rate is 2% (continuous).

Re-compute the value of a call option with maturity of 1 year, with an exercise price of €5.2, based on the binomial model, considering bi-monthly intervals (each branch is 2 months long).