Financial Mathematics

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[1] Based on Robert L. McDonald's *Derivatives Markets*, 3rd Ed, Pearson, 2013.

Chapter 10. Binomial Option Pricing: Basic Concepts

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§ 10.1 A one-period Binomial tree

§ 10.2 Constructing a Binomial tree

§ 10.3 Two or more binomial periods

§ 10.4 Put options

§ 10.5 American options

§ 10.6 Options on other assets

§ 10.7 Problems

Chapter 10. Binomial Option Pricing: Basic Concepts

At each node we use the following formula to compute the price:

$$P(S,K,t) = \max\left(K - S, e^{-rh}\left[P(uS,K,t+h)p^* + P(dS,K,t+h)(1-p^*)\right]\right)$$

$$p^* = \frac{e^{(r-\delta)h} - d}{u - d}$$

Or simply

$$P(S,K,t) = \max\left(K - S, \Delta S + B\right)$$

FIGURE 10.7

Binomial tree for pricing an American put option; assumes $S = \$41.00$, $K = \$40.00$, $\sigma = 0.30$, $r = 0.08$, $T = 1.00$ years, $\delta = 0.00$, and $h = 0.333$. At each node the stock price, option price, Δ, and B are given. Option prices in ***bold italic*** signify that exercise is optimal at that node.