2.3 European Call

Consider a European call option maturing in 47 days with $S = 9.3$, $K = 9.5$, $r_c = 0.03$, $\sigma = 0.2$. Value the option using:

(a) A CRR model with three steps,
(b) An equal-probabilities model with three steps,
(c) A trinomial model with three steps,
(d) Black-Scholes.

SOLUTION

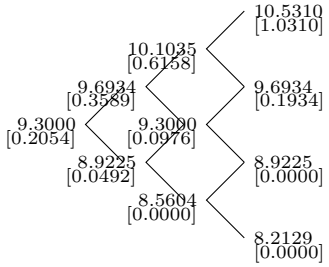
(a)

$$\Delta t = 0.0429$$

$$u = 1.0423$$

$$d = 0.9594$$

$$p_u = 0.5052$$



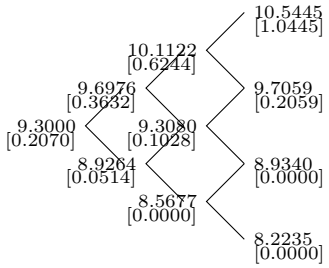
(b)

$$\Delta t = 0.0429$$

$$u = 1.0428$$

$$d = 0.9598$$

$$p_u = 0.5000$$



(c)

$$\Delta t = 0.0429$$

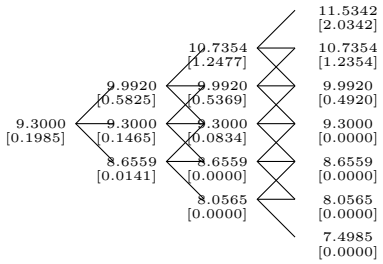
$$u = 1.0744$$

$$d = 0.9307$$

$$p_u = 0.1697$$

$$p_m = 0.6667$$

$$p_d = 0.1637$$



d)

$$d_1 = -0.2068.$$

$$d_2 = -0.2785.$$

$$C = 0.1947.$$