

2.5 American Call with Dividends

Consider an American call option maturing in 68 days with $S = 3.8$, $K = 2.3$, $r_c = 0.02$, $\sigma = 0.3$. A dividend equal to CU 0.8 is due in 37 days (ex-date as well as payment date).

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.

SOLUTION

(a)

$$\Delta t = 0.0621$$

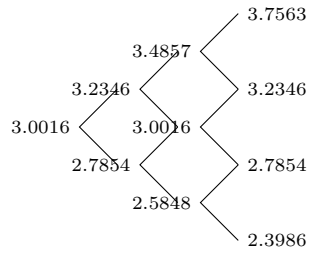
$$u = 1.0776$$

$$d = 0.9280$$

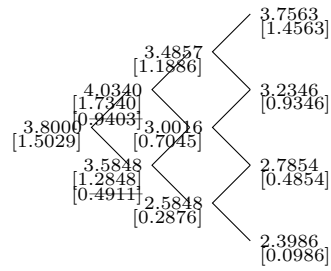
$$p_u = 0.4896$$

$$S^* = 3.0016$$

Lattice 1:



Lattice 2 and solution:



(b)

$$\Delta t = 0.0621$$

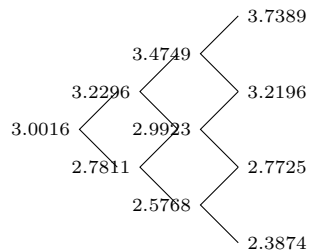
$$u = 1.0760$$

$$d = 0.9265$$

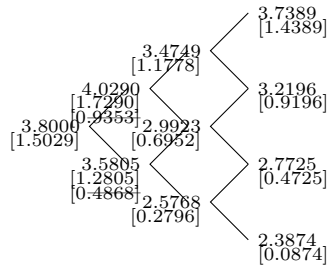
$$p_u = 0.5000$$

$$S^* = 3.0016$$

Lattice 1:



Lattice 2 and solution:



(b)

$$\Delta t = 0.0621$$

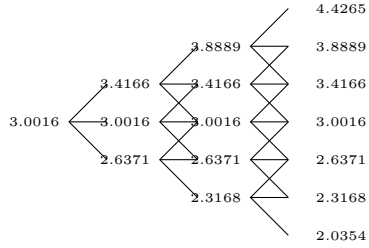
$$u = 1.1382$$

$$d = 0.8785$$

$$p_u = 0.1607$$

$$S^* = 3.0016$$

Lattice 1:



Lattice 2 and solution:

