
Homework 3:

1. For a BAPM where $S_0 = 10$, $u = 1.5$, $d = .75$, $r = .1$, $p = \frac{1}{2} = q$, and $N = 2$, answer the following:
 - (a) Express Z the Radon-Nikodym derivative of \tilde{p} with respect to \mathbb{P} .
 - (b) Express the Radon-Nikodym derivative process at time 1.
 - (c) Express the state price density process ζ_n for $n = 0, 1, 2$.
2. For a BAPM where $S_0 = 100$, $u = 1.15$, $d = .95$, $r = .1$, $p = \frac{2}{3}$, $q = \frac{1}{3}$, and $N = 2$, answer the following:
 - (a) Express ζ the state price density random variable.
 - (b) Use the state price to determine the value of a European call option with strike equal to 100.
3. For a BAPM where $S_0 = 100$, $u = 1.15$, $d = .95$, $r = .1$, $p = \frac{2}{3}$, $q = \frac{1}{3}$, and $N = 3$, answer the following:
 - (a) Determine the value of an American put option with strike equal to 100.
 - (b) Determine the Δ_n and C_n , $n = 0, 1, 2$ for this option

From the textbook (Shreve Vol 1):

4. 3.1
5. 3.3
6. 4.1