

Errata Lecture Notes

Last update:

December 2, 2020

1. The example at the end of pag. 66 has some wrong numbers. The whole text in the example should be replaced by this (the changes are highlighted in red color)

Example. Let us compute the position on the stock in the hedging portfolio (3.11) for the example of standard derivative in Section 3.1. When the stock price goes up in the first step we have $S(1) = S(1, u) = 2$ and $\Pi_Y^u(2) = \Pi_Y^u(2, u) = \Pi_Y(2, u, u) = 1$, $\Pi_Y^d(2) = \Pi_Y^d(2, u) = \Pi_Y(2, u, d) = \sqrt{2} - 1$, hence (3.11a) gives

$$h_S(2, u) = \frac{1}{S(1, u)} \frac{\Pi_Y^u(2, u) - \Pi_Y^d(2, u)}{e^u - e^d} = \frac{1}{2} \frac{1 - (\sqrt{2} - 1)}{2 - 1} = 1 - \frac{\sqrt{2}}{2} > 0 \quad (\text{long position}).$$

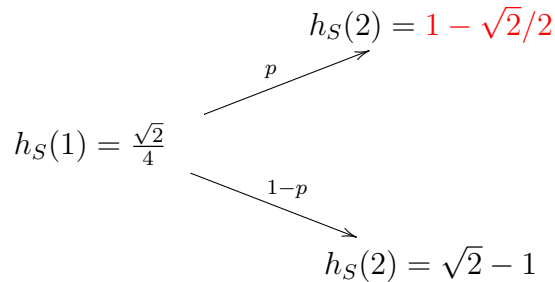
When $S(1) = S(1, d) = 1$ we have $\Pi_Y^u(2) = \Pi_Y^u(2, d) = \Pi_Y(2, d, u) = \sqrt{2} - 1$ and $\Pi_Y^d(2) = \Pi_Y^d(2, d) = \Pi_Y(2, d, d) = 0$, hence

$$h_S(2, d) = \frac{1}{S(1, d)} \frac{\Pi_Y^u(2, d) - \Pi_Y^d(2, d)}{e^u - e^d} = \sqrt{2} - 1 > 0 \quad (\text{long position}).$$

Recall that $h_S(2)$ is the position in the stock in the interval $(1, 2]$. In the interval $[0, 1]$ we have

$$h_S(1) = \frac{1}{S(0)} \frac{\Pi_Y^u(1) - \Pi_Y^d(1)}{e^u - e^d} = \frac{1}{1} \frac{\frac{1}{4}(2\sqrt{2} - 1) - \frac{1}{4}(\sqrt{2} - 1)}{2 - 1} = \frac{\sqrt{2}}{4} > 0 \quad (\text{long position}).$$

The result can be expressed in a binomial tree as follows:



The position on the risk-free asset can be computed likewise using (3.11b)

2. On pag. 188, the final number in the line starting with $V(2, u, u)$ should be -16 . Moreover in the lines starting with $V(2, d, u)$ and $V(2, d, d)$, the number $-\frac{7}{2}$ should be replaced by $\frac{7}{2}$
3. On pag. 190, in the last line of the solution to exercise 3.3, it should be $\mathbb{P}(S^{(d,d)})$ instead of $\mathbb{P}(S^{(u,u)})$
4. In the Matlab code 4.1 on page 91, the following line should be added after `Price = zeros(N + 1);`

`C = zeros(N + 1);`

The effect of this line is to make C a $(N + 1) \times (N + 1)$ matrix, as the matrix *Price*, otherwise it will be a $N \times (N + 1)$ matrix (e.g. the matrix C at the bottom of pag. 90 is only 5×6 , while it should be 6×6 as the matrix *Price* on its left. After correcting the code as indicated above, there will be a new last row in C with all zero elements).

5. The HINT for Exercise 6.24 on page 164 should be “You need Theorem 6.6”