

Quiz A: 8/6/14

Name Key

Assume that Sweltering Inc. has a current stock price of \$92 and that its stock price will rise by \$10 per share or fall by \$5 per share for each of the next two years. Assume also that the risk-free interest rate equals 5% per year.

- a. What is the value today of a call with a \$95 strike price that expires two years from today?  
 b. Assume you plan to build a portfolio today that will allow you to achieve the same payoffs as the call in part a. What transaction involving stock would you need to undertake a year from today to rebalance your portfolio if Sweltering's stock price drops a year from today?  
 c. Assume you have built the portfolio in part b and that Sweltering's stock price rises a year from today but falls two years from today (from year 1). What specific transactions will you undertake two years from today to close out your portfolio? What individual and total cash flows will your transactions generate?

✓ = +1

$$S_U = 102, S_D = 87, S_{UU} = 112, S_{UD} = S_{DU} = 97, S_{DD} = 82, C_{UU} = 17, C_{UD} = C_{DU} = 2, C_{DD} = 0$$

(17)  $\Delta_U = \frac{17 - 2}{112 - 97} = +1; B_U = \frac{2 - 1(97)}{1.05} = -90.4762; C_U = 1(102) - 90.4762 = 11.5238$

(17)  $\Delta_D = \frac{2 - 0}{97 - 82} = +0.1333; B_D = \frac{0 - (.1333)(82)}{1.05} = -10.4127; C_D = (.1333)(97) - 10.4127 = 1.1873$

(17)  $\Delta = \frac{11.5238 - 1.1873}{102 - 87} = +0.6891; B = \frac{1.1873 - (.6891)(87)}{1.05} = -55.9661; C = (.6891)(92) - 55.9661 = 7.4311$

(2) a. 7.4311

(4) b. Sell .5558 shares (.6891 - .1333)

(8) c. Sell 1 share of stock; CF = ~~1~~(97) = 97

(8) Buy to cover bonds worth  $90.4762(1.05) = 95; CF = \del{95}$

(2) Net = 97 - 95 = +2