

Quiz B: 8/6/14

Name Key

Assume that Heatdex 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.

- What is the value today of a put with a \$100 strike price that expires two years from today?
- Assume you plan to build a portfolio today that will allow you to achieve the same payoffs as the put in part a. What transaction involving bonds would you need to undertake a year from today to rebalance your portfolio if Heatdex's stock price rises a year from today?
- Assume you have built the portfolio in part b and that Sweltering's stock price falls a year from today and falls again two years from today. 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?

$$S_U = 102, S_D = 87, S_{UU} = 112, S_{UD} = S_{DU} = 97, S_{DD} = 82, P_{UU} = 0, P_{UD} = P_{DU} = 3, P_{DD} = 18$$

$$(17) \quad \checkmark \Delta_U = \frac{\checkmark 0 - \checkmark 3}{\checkmark 112 - \checkmark 97} = -0.2; \quad \checkmark B_U = \frac{\checkmark 3 - (\checkmark -2)(\checkmark 97)}{\checkmark 1.05} = 21.3333; \quad \checkmark P_U = 102(\checkmark -2) + 21\checkmark 3333 = 0.9333$$

$$(17) \quad \checkmark \Delta_D = \frac{\checkmark 3 - \checkmark 18}{\checkmark 97 - \checkmark 82} = -1; \quad \checkmark B_D = \frac{\checkmark 18 - (\checkmark -1)(\checkmark 82)}{\checkmark 1.05} = 95.2831; \quad \checkmark P_D = 87(\checkmark -1) + 95\checkmark 2831 = 8.2381$$

$$(17) \quad \checkmark \Delta = \frac{\checkmark 0.9333 - \checkmark 8.2381}{\checkmark 102 - \checkmark 87} = -0.4870; \quad \checkmark B = \frac{\checkmark 8.2381 - (\checkmark -0.4870)(\checkmark 87)}{\checkmark 1.05} = 48.1959; \quad \checkmark P = 92(\checkmark -0.4870) + 48\checkmark 1959 = 3.3934$$

$$(2) \quad \checkmark a. 3.3934$$

$$(4) \quad \checkmark b. \text{ Sell } 29.7724 \text{ of bonds } (21.3333 - 48.1959(1.05)) \text{ or } -(-2 - (-0.4870))(102)$$

$$(8) \quad \checkmark c. \text{ Buy to cover 1 share; CF} = \ominus 1(82) = -82$$

$$(8) \quad \checkmark \text{ Sell bonds worth } 95.2831(1.05) = 100; \text{ CF} = \oplus 100$$

$$(2) \quad \checkmark \text{ Net} = +100 - 82 = +18$$