Quiz A: 4/11/12 Name & Time Key

Quiz: Suspend Campaign Company has a current stock price of $60. For the next two years, Suspend's stock price will either rise by 10% per share or fall by 6% per share.

a. Set up the calculations needed to determine the value of a put today with a strike price of $65 if the risk-free interest rate is 4% per year and is not expected to change.

b. Set up the calculations needed to determine how many bonds would you need to buy or sell a year from today if Suspend's stock price falls by 6% next year?

Note: Bonus WSJ Questions on back of page

a. $S_u = 60(1.1) = 66$; $S_d = 60(.94) = 56.4$

$S_{uu} = 60(1.1)^2 = 72.6$; $S_{ud} = S_{du} = 60(1.1)(.94) = 62.04$; $S_{dd} = 60(.94)^2 = 53.016$

$K = 65$

$P_{uu} = 0$, $P_{ud} = 65 - 62.04 = 2.96$, $P_{dd} = 65 - 53.016 = 11.984$

t = 1

$\Delta_u = \dfrac{0 - 2.96}{72.6 - 62.04} = -.2803$; $B_u = \dfrac{2.96 - (-.2803)(62.04)}{1.04} = 19.5673$

$P_u = 66(-.2803) + 19.5673 = 1.0673$

$\Delta_d = \dfrac{2.96 - 11.984}{62.04 - 53.016} = -1$; $B_d = \dfrac{11.984 - (-1)(53.016)}{1.04} = 62.50$

$P_d = 56.4(-1) + 62.5 = 6.1$

t = 0

$\Delta = \dfrac{1.0673 - 6.1}{66 - 56.4} = -0.5242$; $B = \dfrac{6.1 - (-.5242)(56.4)}{1.04} = +34.2953$

$P = 60(-.5242) + 34.2953 = 2.84$

b. 1) Change in stock $= -1 - (-.5242) = -.4758$

⇒ short sell .4758 share for $.4758(56.4) = -26.835$

⇒ Buy \$26.835 in bonds.

or 2) Bonds if do nothing $= 34.2953(1.04) = 35.667$

⇒ Change in bonds $= 62.50 - 35.667 = 26.833$

⇒ Buy 26.833 bonds.