

4/15/13  
 Quiz A for 1:00 Class: ~~04/10/13~~

Name Key

Assume the risk-free rate equals 3%. Assume also that Sell Computer's current stock price is \$50 per share and that its stock price will either rise by \$7 or fall by \$5 each of the next two years. Thus, Sell's stock price will equal either \$57 or \$45 one year from today and either \$64, or \$52, or \$40 two years from today. Assume that the replicating portfolios for a certain option that matures two years from today would need to consist of the following: Today:  $\Delta = -0.59284$ ,  $B = 34.05422$ ; if Sell's stock price rises to \$57 next year:  $\Delta = -0.25$ ,  $B = 15.53398$ ; if Sell's stock price falls to \$45 next year:  $\Delta = -1$ ,  $B = 53.39806$ . Note: use "+" for inflow, "-" for outflow in your answers.

- What transactions would be required today to set up your replicating portfolio? What will the cash flows from these transactions equal?
- Assume that Sell's stock price falls to \$45 next year. What transactions would be required next year to rebalance the replicating portfolio? What will the cash flow from each transaction equal?
- Assume that Sell's stock price ends up at \$64 two years from today. What transactions will liquidate the replicating portfolio in two years? What will the cash flows from these transactions equal?
- Is the option a put or a call?

Wall Street Journal Questions are on the back of this page.

a. (short sell <sup>+5</sup> .59284 shares) + (buy <sup>+5</sup> 34.05422 of bonds)

$$CF = (+.59284(50) - 34.05422) = -4.41222$$

b. (short sell <sup>+5</sup> .40716 shares) + (buy <sup>+5</sup> 18.3222 of bonds)  
 (or 18.31501)

$$-.40716 = -1 - (-.59284)$$

$$CF_s = (+.40716(45) - 18.3222)$$

$$CF_b = (-18.3222) = \text{proceeds of stock short or } -(53.39806 - 34.05422(1.03)) = -18.31501$$

c. (All bonds <sup>+5</sup> mature) (or sell all bonds) and (buy <sup>+5</sup> + return to lender .25 shares)

$$CF = (15.53398(1.03) - .25(64)) = 0$$

d. Put +2