

Assume the risk-free rate equals 2%. Assume also that Sell Computer's current stock price is \$70 per share and that its stock price will either rise by \$8 or fall by \$6 each of the next two years. Thus, Sell's stock price will equal either \$78 or \$64 one year from today and either \$86, or \$72, or \$58 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:  $\Delta = 0.76471$ ,  $B = -44.48289$ ; if Sell's stock price rises to \$78 next year:  $\Delta = 1$ ,  $B = -63.72549$ ; if Sell's stock price falls to \$64 next year:  $\Delta = 0.5$ ,  $B = -28.43137$ . 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 \$64 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 \$86 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. (Buy  $.76471$  shares) + (short-sell  $44.48289$  bonds)

$$CF = (-.76471(70) + 44.48289) = -9.04681$$

b. (Sell  $.26471$  shares) + (buy and return to lender  $\$16.94144$  of bonds)  
(or  $16.94112$ )

$$-.26471 = .5 - .76471$$

$$CF_s = (.26471(64)) = +16.94144$$

$$CF_B = (-16.94144) = \text{proceeds of stock sale or } -(-28.43137 - (-44.48289)(1.02)) = -16.94112$$

c. (sell share of stock) + (buy and return to lender  $\$65$  of bonds)  
(or return  $\$65$  to lender)

$$65 = 63.72549(1.02)$$

$$CF = (1(86) - 63.72549(1.02)) = 21$$

d. call +2