Recount Inc. has a current price of $60 per share. For each of the next two years, Recount’s stock price will either rise $12 per share or fall $8 per share. Thus, Recount’s stock price will equal either $72 or $52 per share one year from today, and Recount’s stock price will equal either $84 or $64 or $44 per share two years from today. Assume that the risk-free interest rate equals 6% and that replicating portfolios for a particular call on Recount would need to consist of the following:

Today: $\Delta = +0.8743, B = -35.9644$

One year from today:
- If Recount’s stock price climbs to $72: $\Delta = +1.0, B = 47.1698$
- If Recount’s stock price falls to $52: $\Delta = +0.7, B = -29.0566$

a. What transactions would be required today and one year from today to build the replicating portfolios?
b. Assume Recount’s stock price climbs to $72 next year. Calculate the possible payoffs two years from today on the portfolio you built one year from today ($\Delta = +1.0, B = -47.1698$)?

c. Assume Recount’s stock price falls to $52 next year. Calculate the possible payoffs two years from today on the portfolio you build one year from today ($\Delta = +0.7, B = -29.0566$)?

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

a. Today $\Rightarrow$ (Buy $0.8743$ shares) + (Short $35.9644$ of bonds)

In one year:
- If $S = 72$ $\Rightarrow$ Buy $0.1257$ shares $\Rightarrow$ Short $9.0564$ of bonds (to lend)
  1) If do nothing, $B = 38.1223 = -35.9644(1.06)$
  $\Rightarrow$ change $= 47.1698 - (-38.1223) = 85.0921$
  2) $\Delta$ value of shares $= 0.1257 \times 72 = 9.0564$
  $\Rightarrow$ short $9.0564$ of bonds to lend.

If $S = 52$ $\Rightarrow$ Sell $0.1743$ shares $= 0.7 - 0.8743$
  $\Rightarrow$ Buy $9.0636$ of bonds + return to lender
  1) If do nothing, $B = 38.1223$
  $\Rightarrow$ change $= -29.0566 - (-38.1223) = -74.0654$
  2) $\Delta$ value of shares sold $= 0.1743 \times 52 = 9.0636$
  $\Rightarrow$ buy $9.0636$ of bonds w/ funds

b. If $S = 84$, pay off = $1(84) - 47.1698(1.06) = 39.6266$
- If $S = 64$, pay off = $1(64) - 47.1698(1.06) = 14.6266$
- If $S = 44$, pay off = $1(44) - 29.0566(1.06) = 0.6266$

C. If $S = 64$, pay off = $0.7(64) - 29.0566(1.06) = 14.6266$
- If $S = 44$, pay off = $0.7(44) - 29.0566(1.06) = 0.6266$