Key to Quiz C: 4/4/12

Quiz: Assume a firm's stock price currently equals $52 and that its stock price will either rise by 15% or fall by 10% one year from today. Assume also that the risk free rate of return is 2% and that you are evaluating a call with a strike price of $50.
a. What are the potential payoffs on the long call?
b. What portfolio of stocks and risk-free bonds will duplicate the payoffs on the call?
c. What payoff would each part of the portfolio generate if the stock price rises by 15% next year?
d. What payoff would each part of the portfolio generate if the stock price falls by 10% next year?
e. What is the value of the long call today?

S_u = 52(1.15) = 59.8; S_d = 59(.9) = 46.8

a. C_u = 9.8, C_d = 0

b. $\Delta = \frac{9.8-0}{59.8-46.8} = 0.7538$; $B = \frac{0-0.7538(46.8)}{1.02} = -34.5882$ => buy 0.7538 shares and short-sell $34.5882 of risk-free bonds.

c. Stock = .7538(59.8) = 45.08; Bond = -34.5882*1.02 = -35.28

d. Stock = .7538(46.8) = 35.28; Bond = -35.28

e. C = .7538(52) – 34.5882 = 4.6118