Quiz A for 2:30 Class: 10/31/12 Name Key

Assume a stock worth $100 will rise by 20% or fall by 10% by one year from today. Assume also that the risk-free interest rate is 2%.

a. What is the value of a put with a $110 strike price?
b. What investments would be required to create a portfolio that duplicates the payoff on the put?
c. What would be the payoff on each part of the portfolio (in part b) if the stock rises 20%?
d. What would be the payoff on each part of the portfolio (in part b) if the stock falls 10%?

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

a. $S_u = 100(1.2) = 120$, $S_d = 100(.9) = 90$

$P_u = 0$, $P_d = 20$

$\Delta = \frac{0-20}{120-90} = -\frac{2}{3}$; $B = \frac{20 - 90(-\frac{2}{3})}{1.02} = +78.4314$

$P = 100(-\frac{2}{3}) + 78.4314 = 11.7647$

b. (Short sell $\frac{2}{3}$ of share) + (invest (buy) 78.4314 in risk-free bonds)

c. Stock $= -80 = -\frac{2}{3}(120)$

Bonds $= +80 = 78.4314 \times 1.02$

d. Stock $= -60 = -\frac{2}{3}(90)$

Bonds $= +80 = 78.4314 \times 1.02$