Assume you want to calculate the beta of a call and put on Fell Computers with a strike price of $15 that expires seven months from today. Using the following information, set up all calculations needed to determine the beta of a) the call and b) the put.

Information on Fell assets: current value = $18 billion, required return = 6%, standard deviation of returns = 25%, beta = 1.1, expected dividends = $208 million in 2 months, $242 million in 5 months, $277 million in 8 months

Information on Fell stock: current price = $13, required return = 8%, standard deviation of returns = 28%, beta = 1.5, expected dividends per share = .15 in 2 months, .175 in 5 months, and .20 in 8 months.

Information on Fell bonds: current value = $3 billion, required return = 3%, standard deviation of returns = 6%, beta = 0.2, next coupon payment = $45 million five months from today.

Information on call: current value = $0.45, standard deviation of returns = 233%

Information on put: current value = $2.44, standard deviation of returns = 106%

Returns on U.S. Treasuries by maturity (all < 1%): 1 – month = 0.025%, 2 – month = 0.030%, 3 – month = 0.035%, 4 – month = 0.076%, 5 – month = 0.081%, 6 – month = 0.083%, 7 – month = 0.086%, 8 – month = 0.091%, 9 – month = 0.096%

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

a) $\beta_C = \left(\dfrac{\Delta S^K}{\Delta S^K + B}\right) 1.5$ (4)

$+2 \left(D_C = N(d_1) \right)$ (2)

$+2 \left(d_1 = \dfrac{\ln\left(\frac{S^K}{PV(K)}\right)}{.28\sqrt{\frac{7+1}{12}}} + \dfrac{.28\sqrt{\frac{7+1}{12}}}{2} \right)$ (6)

$+2 \left(S^K = 13 - \dfrac{.15}{(1.08)^{2/12}} - \dfrac{.175}{(1.08)^{5/12}} \right)$ (14)

$+2 \left(PV(K) = \dfrac{15}{(1.00086)^{7/12}} \right)$ (8)

$+2 \left(B_C = -PV(K) N(d_2) \right)$ (2)

$+2 \left(d_2 = d_1 - .28\sqrt{\frac{7}{12}} + 2 \right)$ (6)

b) $\beta_P = \left(\dfrac{\Delta S^K}{\Delta S^K + B}\right) 1.5$ (4)

$+2 \left(D_P = -(1 - N(d_1)) \right)$ (2)

$+2 \left(B_P = PV(K)(1 - N(d_2)) \right)$ (2)

$N() \Rightarrow$ look up on table or in Excel