Quiz B for 2:30 Class: 11/20/13 Name Key

Short Answer 1 (15 points): What rate would you use when calculating PV(K) when determining the value of a possible expansion of a project over the next four years if cash flows exceed expectations? Be specific.

(4-year) (risk-free rate) +8/+7

Short Answer 2 (15 points): Assume that Best Byte has debt that matures five years from today. When calculating the beta of Best Byte's assets, you must determine Δ. And when determining Δ, you must take the natural log (ln) of a ratio. What would you use for the numerator (number on top) of this ratio? Answer in words and be specific.

(Market value) of (firm's assets) +8/+7

Problem (75 points): Use the following information to set up the calculations needed to determine the beta of a call on 3Million Products Inc. stock that expire three months from today with a strike price of $20.

Current market values (on a per share basis): assets = $35, stock = $21, call = $1.45, put = $0.25
Betas: assets = 0.8, stock = 1.3, bonds = 0.3
Standard deviation of returns: assets = 35%, stock = 48%, bonds = 8%, call = 210%, put = 340%
Maturity: assets = 20 years (average), bonds = 15 years. Note the per-share maturity value of the bonds = $15
Annual required returns: assets = 9%, stock = 14%, bonds = 4%
Annualized risk-free rates by maturity (all less than 1%): 1-month = 0.046%, 2-month = 0.030%, 3-month = 0.071%, 4-month = 0.066%, 5-month = 0.086%, 6-month = 0.091%, 7-month = 0.072%
Upcoming dividends on stock: two months = $0.20, five months = $0.25, eight months = $0.26
Upcoming coupons (on a per share basis) on bonds: one month = $0.05, seven months = $0.05

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

+4 $\beta_C = \left(\frac{\Delta S}{\Delta S + B}\right) 1.3$ (8)

+4 $\Delta = N(d_1)$ (4)

+4 $d_1 = \frac{\ln\left(\frac{S}{PV(K)}\right)}{.48\sqrt{\frac{3}{12}}} + \frac{.48\sqrt{\frac{3}{12}}}{2}$ (10)

+4 $S = S^* = 21 - \frac{.2}{(1.14)^{3/12}}$ (24)

+4 $PV(K) = \frac{20}{(1.00071)^{3/12}}$ (16)

+4 $B = -PV(K)\,N(d_2)$ (4)

+4 $d_2 = d_1 - .48\sqrt{\frac{3}{12}}$ (8)

$N(d_1)$ & $N(d_2)$ → look up on table or in Excel +1 (1)