Fall 2013: Final A for 2:30 class

2:30 A|

$-\frac{1}{2}$ of points earned for each extra, wrong answer

SA| +15 1. none

+8/+7 2. APR, # of compounding periods per year

+15 3. Inflation rate

+8/+7 4. expenses, tax rate

+12/+3 5. reduce it early but increase it later

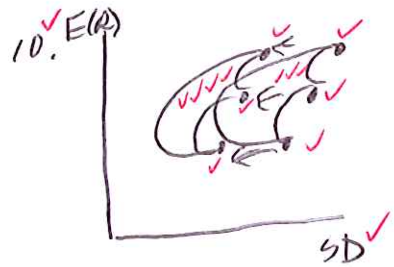
+15 6. weight of asset with lower standard deviation

+8/+7 7. market value of debt, expected return on unlevered equity

+15 8. stock price

9. $\beta_D = (1-.87286)\left(\frac{800}{300}\right)(0.6)$ (+3 +3 +3 +3 +3)

10.



Pd 1. $S+P = C + PV(K)$ $\quad PV(K) = \frac{40}{(1.00025)^{65/365}} = 39.998$

$37.62 + 2.96 = 0.4 + 39.998$

$40.58 \neq 40.398$

sell Buy

Trans	CF_0	CF_1: 35	CF_1: 45
+4 Short stock	+37.62 +4	-35 +4	-45 +4
+4 Sell put	+2.96 +4	-5 +4	0 +4
+4 Buy call	-0.40 +4	0 +4	+5 +4
+4 Buy risk-free bond	-39.998 +4	+40 +4	+40 +4
Total	+0.182 +4	∅	∅

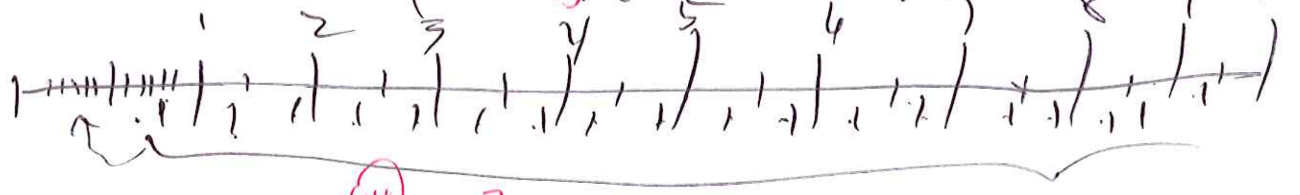
+4/+3

2:30 AH

PJ 2. $NPV = -11 - 150 + \left(\frac{8}{r(\frac{1}{2}) + .01}\right)\left(1 - \left(\frac{1 - .01}{1 + r(\frac{1}{2})}\right)^{18}\right)\left(\frac{1}{1 + r(\frac{1}{2})}\right)^{4}$

+3 +2 +2 +3 +7 +17 (17) (12)

+5 Note: -5 if -1 today +5



$-3 + 3\left(\frac{1}{1 + r(\frac{1}{2})}\right)^{9\frac{4}{12}}$ (14)

+2 +2 +7 +5

-5 if subtract 1 million for plan

+5 ($r(1) = .0279 + .9(.06)$ (13)

+5 ($r(\frac{1}{2}) = (1 + r(1))^{\frac{1}{2}} - 1$ (12)

3\. +4 ($d_1 = \frac{\ln\left(\frac{S}{PV(K)}\right)}{.58\sqrt{3}} + \frac{.58\sqrt{3}}{2}$ (13) +4 +3

$S = \left(\frac{15}{r(1)}\right)\left(1 - \left(\frac{1}{1 + r(1)}\right)^{5}\right)\left(\frac{1}{1 + r(1)}\right)^{3}$ +3 +4 (18)

+3 ($r(1) = 2.79 + 1.1(6)$ (13) ← $.0279 + 1.1(.06)$

$PV(K) = \frac{75}{(1.0065)^{3}}$ +3 (17)

+4 ($d_2 = d_1 - .58\sqrt{3}$ (9)

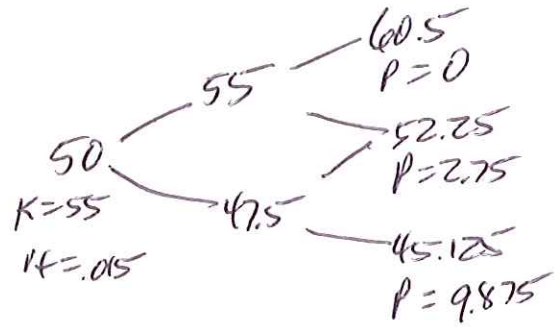
+4 ($C = S(N(d_1)) - PV(K)N(d_2)$ (4)

+4 ($C = S(N(d_1))$ - ... using Excel

+1 $N(\,)$ ⇒ look up on table or using Excel

2:30pm

P1 4.



$\Delta_U = \frac{0-2.75}{60.5-52.25} = -0.3333$ +6

$B_U = \frac{2.75-\Delta_U 52.25}{1.015} = 19.8686$ +6

$P_U = 55\Delta_U + B_U = 1.5353$ +6 (18)

$\Delta_d = \frac{2.75-9.875}{52.25-45.125} = -1$ +6

$B_d = \frac{9.875-(-1)45.125}{1.015} = 54.1872$ +6

$P_d = 47.5(-1) + 54.1872 = 6.6872$ +6 (18)

$\Delta = \frac{1.5353-6.6872}{55-47.5} = -0.6869$ +6

$B = \frac{6.6872-(-.6869)(47.5)}{1.015} = 38.73$ +6

$P = 50(-0.6869) + 38.73 = 4.3889$

+6

+4 Buy +5 to cover .3536 shares (.6869 - .3333)

+6 sell +6 bonds = .3536(55) = 19.448

or $19.8686 - 38.73(1.015) = 19.442$

-½ for each error

2:30 t|

[] 5.

250-400: +7 $\left(\tau^* = 1 - \frac{(1-(.55)(.35))(1-.18)}{(1-.27)} = +0.0925\right.$ +11 +4 +4 +4 (30)

400-650: +7 $\left(\tau^* = 1 - \frac{(1-(.15)(.35))(1-.18)}{(1-.27)} = -0.0643\right.$ +11 +4 +4 +4 (30)

a. optimal = $400 of interest +7

b. raise +8

6. +7 $\left(\beta = \frac{cov_{BA,S\&P}}{var_{S\&P}}\right.$ (7)

+7 $\left(cov_{BA,S\&P} = \frac{1}{3}((84-BA)(21-S\&P) + (2-BA)(14-S\&P) + (9-BA)(2-S\&P) + (18-BA)(20-S\&P))\right.$ (25)

+4 $\left(BA = \frac{1}{4}(84+2+9+18)\right.$ (8)

+4 $\left(S\&P = \frac{1}{4}(21+14+2+20)\right.$ (10)

+7 $\left(var_{S\&P} = \frac{1}{3}((21-S\&P)^2 + (14-S\&P)^2 + (2-S\&P)^2 + (20-S\&P)^2)\right.$ (13)

+8 $\left(r = 2.8 + \beta(8-2.8)\right.$ (14) +2 +4