

Fall 2013: Final B for 2:30 class

2:30 B)

-1/2 of points earned for each extra, wrong answer

9A) 1. initial cash flow, growth rate, number of cash flows, interest rate

+15 2. none of them

+15 3. nominal interest rate

+15 4. none of them

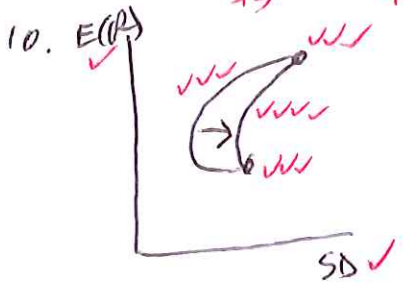
+12/+3 5. decrease early but increase later

+15 6. weight on asset with low risk

+8/+7 7. unlevered equity, beta, market value of debt

+15 8. strike price

$$9. \beta_U = \frac{0.7}{(0.87493)(1 + \frac{300}{500})} + 3$$



$$PV(\text{call}) = \frac{40}{(1.00025)^{65 \times 365}} = 39.998$$

P) 1. $S + P = C + PV(\text{call})$

$$37.62 + 2.96 = 0.70 + 39.998$$

$$\underbrace{40.58}_{\text{buy}} \neq \underbrace{40.698}_{\text{sell}}$$

Trans	CF ₀	CF ₁	CF ₂
+4 Buy stock	-37.62 +4	35	45
+4 Buy put	-2.96 +4	+35 +4	+45 +4
+4 sell call	+0.70 +4	+5 +4	0 +4
+4 short sell risk-free bond	+39.998 +4	0 +4	-5 +4
<u>Total</u>	<u>+0.118 +4</u>	<u>-40 +4</u>	<u>-40 +4</u>
		0	0

+4/+3

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$$P_2. NPV = -20 - 300 + \left(\frac{16}{r(\frac{1}{2}) + 0.02} \right) \left(1 - \left(\frac{1-0.02}{1+r(\frac{1}{2})} \right)^{18} \right) \left(\frac{1}{1+r(\frac{1}{2})} \right)^{4/6}$$

$$-6 + \frac{6}{(1+r(\frac{1}{2}))^{9 \cdot \frac{4}{12}}} \Bigg)^{15}$$

$$+5 \left(r(1) = .0279 + 1(.05) \right)^{13}$$

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

$$3. d_1 = \frac{\ln\left(\frac{S}{PUCF}\right)}{.45\sqrt{1}} + \frac{.45\sqrt{1}}{2}$$

$$S = S^* = \left(\frac{16}{r(\frac{1}{2}) + 0.02} \right) \left(1 - \left(\frac{1-0.02}{1+r(\frac{1}{2})} \right)^{18} \right) \left(\frac{1}{1+r(\frac{1}{2})} \right)^{\frac{4}{6}} - \frac{16}{(1+r)^{10/12}}$$

$$+4 \left(PV(A) = \frac{250}{(1.0015)^{10}} \right)^{15}$$

$$+4 \left(d_2 = d_1 - .45\sqrt{1} \right)^{15}$$

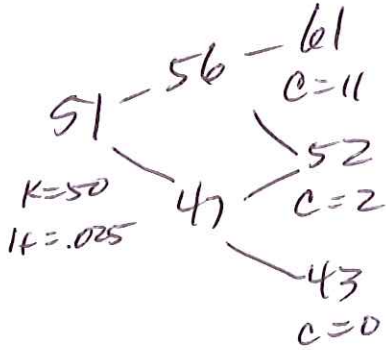
$$+4 \left(P = PUCF (1 - N(d_2)) - S (1 - N(d_1)) \right)$$

+1 $N(x) \Rightarrow$ look up on tables or using Excel

$$+4 \left(r(\frac{1}{2}) = \text{same as } 2 \right)$$

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P] 4.



-1/2 of points earned for each error

$$\Delta_u = \frac{11-2}{61-52} = 1 + b$$

$$B_u = \frac{2 - (1)52}{1.025} = -48.78048 + b$$

$$C_u = 56(1) - 48.78048 = 7.2195 + b \quad (18)$$

$$\Delta_d = \frac{2-0}{52-43} = 0.2222 + b$$

$$B_d = \frac{0 - 0.2222(43)}{1.025} = -9.3225 + b$$

$$C_d = 0.2222(47) - 9.3225 = 1.1219 + b \quad (18)$$

$$\Delta = \frac{7.2195 - 1.1219}{56 - 47} = 0.6775 + b$$

$$B = \frac{1.1219 - 0.6775(47)}{1.025} = -29.9713 + b$$

$$C = 51(.6775) - 29.9713 = 4.5812$$

$$\text{Sell } +b \text{ shares} = .6775 - .2222 = .4553 + b$$

$$\text{Buy } +b \text{ to cover } +b \text{ bonds} = .4553(47) = 21.3991 + b$$

$$\text{or } -29.9713(1.025) - 9.3225 = 21.3981$$

2305

P. 5. a. 500-750: $T^* = 1 - \frac{(1 - (1.15)^{-35})(1 - .18)}{.12} = +.25366$

750-950: $T^* = 1 - \frac{(1 - (1.15)^{-35})(1 - .18)}{.12} = -.04466$

int
of $T = 750$

b. load

6. $SD_p = \sqrt{\left(\frac{100}{500}\right)^2 SD_T^2 + \left(\frac{400}{500}\right)^2 SD_B^2 + 2\left(\frac{100}{500}\right)\left(\frac{400}{500}\right) Cov_{TB}}$

$SD_T^2 = \frac{1}{3}((54-T)^2 + (20-T)^2 + (14-T)^2 + (20-T)^2)$

$SD_B^2 = \frac{1}{3}((84-B)^2 + (2-B)^2 + (9-B)^2 + (18-B)^2)$

$T = \frac{1}{4}(54 + 20 + 14 + 20)$

$B = \frac{1}{4}(84 + 2 + 9 + 18)$

$Cov_{TB} = \frac{1}{3}((54-T)(84-B) + (20-T)(2-B) + (14-T)(9-B) + (20-T)(18-B))$

$ER_p = \left(\frac{100}{500}\right)T + \left(\frac{400}{500}\right)B$