

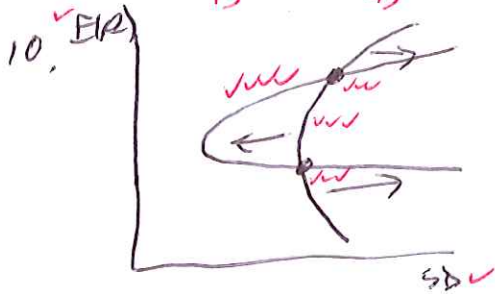
4:00B

Fall 2013: Final B for 4:00 class

-1/2 points earned for extra, wrong answers

- SA] 1. initial cash flow, number of payments, growth rate +5/+5/+5  
 +15 2. none  
 +15 3. none  
 +15 4. depreciation  
 +12/+3 5. increase early and reduce later  
 +15 6. weight on low standard deviation asset  
 +5/+5/+5 7. weight on stock, levered return on equity, return on debt  
 +5/+5/+5 8. stock price, volatility of returns, time to expiration

$$9. \beta_U = \frac{0.7^{+3}}{.87493(1 + \frac{300^{+3}}{500^{+3}})} +3$$



P] 1.  $250 = 85 + \frac{200}{(1.05)^3}$  ← 172.7675

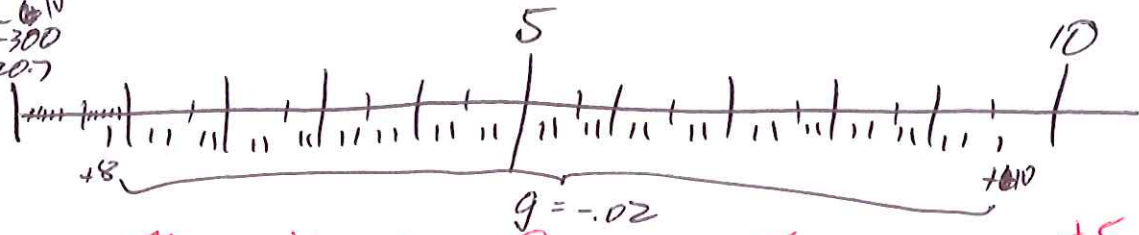
$250 \neq 257.52$   
 buy      short

Trans	CF <sub>0</sub>	CF <sub>1</sub>	CF <sub>2</sub>
+5 Buy Sysco stock	-250 +5	+150 +5	+300 +5
+5 Short Cisco bond	+172.7675 +5	-150 +5	-200 +5
+5 Short Cisco stock	+85 +5	0 +5	-100 +5
TOTAL	+7.7675 +5	0 +5	0 +5

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-10  
-300  
-20.7

P. 2.



$$Land = 20 - 120 - 22 = -20.7$$

$$NPV = -10 - 300 - 20.7 + \left( \frac{8}{r(\frac{1}{4}) + 0.02} \right) \left( 1 - \left( \frac{1-.02}{1+r(\frac{1}{4})} \right)^{36} \right) \left( \frac{1}{1+r(1)} \right)^{\frac{7}{12}}$$

$$+10 \left( r(1) = .0279 + 1(.06) \right) + 10 \left( \frac{1}{1+r} \right)^{9 \frac{7}{12}}$$

$$+10 \left( r(\frac{1}{4}) = (1+r(1))^{\frac{1}{4}} - 1 \right)$$

$$3. \quad d_1 = \frac{\ln \left( \frac{S}{P \cdot u(k)} \right)}{.45 \sqrt{1}} + \frac{.45 \sqrt{1.05}}{2}$$

$$S = S^x = \left( \frac{8}{r(\frac{1}{4}) + 0.02} \right) \left( 1 - \left( \frac{1-.02}{1+r(\frac{1}{4})} \right)^{36} \right) \left( \frac{1}{1+r(1)} \right)^{\frac{7}{12}} - \frac{8}{(1+r(1))^{10 \frac{12}{12}}}$$

$r(1) + r(\frac{1}{4})$  same as P2

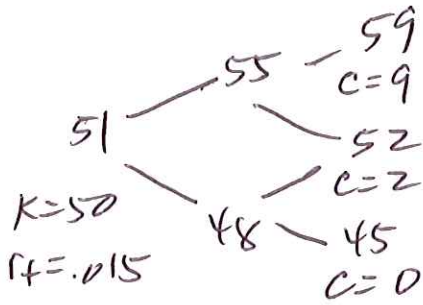
$$P(u(k)) = \frac{250}{(1.0015)^{15}}$$

$$d_2 = d_1 - .45 \sqrt{1.05}$$

$$P = PVO(k) (1 - N(d_2)) - S (1 - N(d_1))$$

$N(x)$  = look up on table or with Excel

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*-1/2 for each error*

$$\Delta_U = \frac{9-2}{59-52} = +1 \text{ } +b$$

$$B_U = \frac{2 - (1)(52)}{1.015} = -49.2611 \text{ } +b$$

$$C_U = 1(55) - 49.2611 = 5.7389 \text{ } +b$$

$$\Delta_D = \frac{2-0}{52-45} = +0.2857 \text{ } +b$$

$$B_D = \frac{0 - (.2857)(45)}{1.015} = -12.6671 \text{ } +b$$

$$C_D = (.2857)(48) - 12.6671 = 1.0471 \text{ } +b$$

$$\Delta = \frac{5.7389 - 1.0471}{55 - 48} = +0.6703 \text{ } +b$$

$$B = \frac{1.0471 - (.6703)(48)}{1.015} = -30.6650 \text{ } +b$$

$$C = 51(.6703) - 30.6650 = 7.5179$$

*+b*  
 sell .3846 shares = .6703 - .2857

*+b*  
*+4* buy to cover bonds worth 18.4608 = .3846 x 48  
*+5*  
 = -12.6671 + 30.665(1.015)

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$$P1 \quad \text{a.} \quad 500-750: \quad T^* = 1 - \frac{(1 - (.45 \times .35)) (1 - .18)}{(1 - .27)} = +0.05366$$

$$750-950: \quad T^* = 1 - \frac{(1 - (.2 \times .35)) (1 - .18)}{(1 - .27)} = -0.04466$$

optimal interest = \$750 +7

b. lower +6

$$b. \quad \beta = \frac{\text{COV}_{TSU, S4P}}{\text{Var}_{S4P}} \quad +7$$

$$+7 \quad \left( \text{COV}_{TSU, S4P} = \frac{1}{3} \left[ (54 - T)(21 - S) + (20 - T)(14 - S) + (14 - T)(2 - S) + (20 - T)(20 - S) \right] \right) \quad (2)$$

$$+4 \quad \left( T = \frac{1}{4} (54 + 20 + 14 + 20) \right) \quad (6)$$

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

$$+7 \quad \left( \text{Var}_{S4P} = \frac{1}{3} \left[ (21 - S)^2 + (14 - S)^2 + (2 - S)^2 + (20 - S)^2 \right] \right) \quad (13)$$

$$+8 \quad \left( r = 2.2 + \beta (7 - 2.2) \right) \quad (14)$$