Finance 3310; Key to Final B: 8/11/15

Short Answer (15 points each)

1. What is one of the two advantages of going public?

+15 one of: greater liquidity; better access to capital

2. Do callable bonds have a higher or lower yield than otherwise identical bonds without a call feature? How about convertible bonds?

+11/+4 callable: higher ; convertible: lower

3. Assume that ~~over~~ the returns on a stock over the past four years ~~equals~~ equaled 15%, -3%, 27% and 2%. Set up the calculations needed to determine the standard deviations of returns on the stock.

+3 ($\bar{R} = \frac{1}{4}(15-3+27+2)$; $SD = \sqrt{\frac{1}{3}((15-\bar{R})^2 + (-3-\bar{R})^2 + (27-\bar{R})^2 + (2-\bar{R})^2)}$ +3

+3 +2 +3

4. Gradual Inc. is a private company with EBITDA of $100 million, sales of $400 million, excess cash of $10 million, debt of $~~200~~ 50 million, and 2 million shares outstanding. Enterprise value to sales for firms in Gradual's industry = 0.48x, 0.29x, 0.40x, 0.27x, 0.65x, 0.48x, 0.42x, and 0.27x. Using the average enterprise value to sales, estimate Gradual's share price. ~~Note: Calculations required.~~

set up the calculations needed to

+3 (Average = $\frac{0.48+0.29+0.40+0.27+0.65+0.48+0.42+0.27}{8}$

+4 (EV = Average × 400 Price = $\frac{EV-(50-10)}{2}$ +4) +4

5. According to the trade-off theory, all else being equal, which type of firm has a higher optimal level of debt: a firm with very volatile cash flows or a firm with very safe, predictable cash flows?

+15 Safe, predictable cash flows

Problems (75 points each)

1. Towngroup bonds mature for $1000 five years from today. The bonds pay an annual coupon rate of 8% with semiannual coupons. Set up the calculations needed to determine the bond's yield to maturity if they currently trade for $1058.99. You don't need to solve anything. If in any step you are solving for something other than the left-hand side of the equation, indicate which variable you are solving for.

$$1058.99 = \frac{40}{y}\left(1 - \left(\frac{1}{1+y}\right)^{10}\right) + \frac{1000}{(1+y)^{10}} \quad \leftarrow \text{solve for } y$$

+8 +7 +8 +7 +9 +9 +4 (24) +8 (24)

+8 YTM = y x 2

2. A year from today, Speedy Coverage Inc. expects earnings of $1.50 per share. For each of the next ~~six~~ four years, Speedy plans to retain and reinvest 75% of its earnings. Retained earnings will be invested in new projects with an expected return of 30%. ~~Six~~ Five years from today, Speedy will drop its retention rate to 25% as the expected return on new investments drops to 6%. Set up the calculations to determine Speedy's stock price if Speedy's equity cost of capital equals 8%. If in any step you are solving for something other than the left-hand side of the equation, indicate which variable you are solving for.

$Div_1 = 1.50(1-.75)$ (6)

$g_{2-5} = .75 \times .3 = A$ (3)

$g_{>5} = .25 \times .06 = B$ (3)

$Earn_5 = 1.50(1+A)^4$ (15)

$Div_5 = .75 \times Earn_5$ (6)

$$P_0 = \left(\frac{Div_1}{.08 - A}\right)\left(1 - \left(\frac{1+A}{1.08}\right)^4\right) + \left(\frac{Div_5}{.08 - B}\right)\left(\frac{1}{1.08}\right)^4$$

(18) (15) (9)

v = +3

3. Assume that Krafty Foods and Whole Cheese have identical assets that will pay off either $400 million or $600 million a year from today. Krafty is funded with equity that has a market value of $480 million, but Whole Cheese is funded with equity and debt that matures for $440 million one year from today. The market value of Whole Cheese bonds is $380 million and of its equity is $80 million. If markets are perfect, what set of transactions today will generate an arbitrage profit for you? Show that the conditions of arbitrage are met regardless of whether the firms' assets end up begin worth $400 million or $600 million. Notes: 1) calculations required, 2) use "+" for inflows and "–" for outflows.

value of Whole Cheese = 380 + 80 = 460 < Krafty Foods
⇒ Buy whole cheese + sell Krafty Foods

Transaction	CF_0	CF_1: 400	CF_1: 600
+5 Buy WC stock	−80 +5	Ø +5	+160 +5
+5 Buy WC bonds	−380 +5	+400 +5	+440 +5
+5 Short sell Krafty stock	+480 +5	−400 +5	−600 +5
Total	+20 +5	Ø +5	Ø +5

4. Assume that Goggle Search Inc. is considering whether to invest in a new plant to manufacture virtual-reality goggles. The new facility will cost $150 million today and $200 million a year from today. This cost is in addition to the $100 million Goggle spent a year ago developing the goggles. The factory will produce its first net annual cash flow of $250 million three years from today and net cash flows are expected to grow by 5% per year through the closing of the factory 25 years from today. If Goggle builds the factory, the firm's net working capital will increase by $10 million three years from today but will return to its present level when the factory is closed.

   The beta of the factory (1.4) exceeds the beta of Goggle's existing factories (1.2). Similarly, the standard deviation of returns on the factory (35%) exceeds the standard deviation of returns on Goggle's existing factories (24%).

   The market risk premium equals 5% and the risk-free interest rate varies by maturity as follows: 1-year = 0.1%, 2-year = 0.5%, 3-year = 0.9%, 4-year = 1.4%, 5-year = 1.7%, 6-year = 1.9%, 7-year = 2.1%, 8-year = 2.4%, 9-year = 2.5%, 10-year = 2.6%, 15-year = 2.9%, 20-year = 3.1%

   Set up the calculations needed to determine whether Goggle should build the factory if the ability to sell or expand the factory is not considered. Note: you only need to set up the calculations. You don't need to solve anything. If in any step you are solving for something other than the left-hand side of the equation, indicate which variable you are solving for.

$$+8\,(17)\quad r = .026 + 1.4(.05)$$

$$NPV = -150 - \frac{200}{1+r} - \frac{10}{(1+r)^3} + \left(\frac{250}{r-.05}\right)\left(1-\left(\frac{1.05}{1+r}\right)^{23}\right)\left(\frac{1}{1+r}\right)^2 + \frac{10}{(1+r)^{25}}$$

(3) (7) (11) (18) (8) (11)

Add ⇒ The risk-free rate equals 2% and the expected return on the market equals 9%.

5. Scorched Earth has a stock price of $30 per share with10 million shares outstanding. The beta of Scorched Earth stock is 1.3 and the standard deviation of returns on its stock is 40%. Scorched Earth also has outstanding bonds with a market value of $200 million. The yield to maturity on this debt equals 8%. There is a 5% chance that Scorched Earth will default on these bonds, and in the case of default, the expected loss rate is 45%. The corporate tax rate equals 35%.
   a. Set up the calculations needed to solve for the expected return on Scorched Earth's bonds.
   b. Set up the calculations needed to solve for Scorched Earth's equity cost of capital.
   c. Set up the calculations needed to solve for Scorched Earth's unlevered cost of capital.
   d. Set up the calculations needed to solve for Scorched Earth's weighted average cost of capital.

a. $r_B = .08 - .05(.45)$ +5 +5 +5 +6 (21)

b. $r_E = .02 + 1.3(.09 - .02)$ +5 +5 +8 +6 (24)

c. $E = 30 \times 10$ +8 (8)

$r_U = \left(\frac{E}{E+200}\right) r_E + \left(\frac{200}{E+200}\right) r_B$ +5 +6 (11)

d. $r_{WACC} = \left(\frac{E}{E+200}\right) r_E + \left(\frac{200}{E+200}\right) r_B(1-.35)$ ✓ +5 +6 (11)