

## EXAM #2 PRACTICE PROBLEMS

### BONDS

The bond valuation equations utilizes the equation(s) for

- a. An annuity
- b. A perpetuity
- c. Present value
- d. a & c**
- e. b & c

Why does this make sense?

$$\text{PV}(\text{coupon}) + \text{PV}(\text{par}) = \text{PV}(\text{annuity}) + \text{PV}(\text{lump sum})$$

How much would you pay for a bond with \$1000 face value, 10 years to maturity, a 8% coupon rate, paid annually, if the current yield to maturity is 10%?

$$\mathbf{B = 80[(1-1/1.1^{10})/.1] + 1000/1.1^{10}}$$

A callable bond requires a **higher** or lower (Circle one) coupon rate than a non-callable bond. This is due to the:

- a. Option for bondholder
- b. Option for issuing firm**

Protective covenants:

- a. are primarily designed to protect the issuing corporation from unreasonable demands of bondholders.
- b. generally apply only to government bonds.
- c. are limited to stating actions which a firm must take.
- d. only apply to bonds that have a deferred call provision.
- e. are primarily designed to protect bondholders from future actions of the bond issuer.**

Which have more interest rate price risk?

- a. Long term bonds**
- b. Larger coupon bonds
- c. Answers a and b are both correct.
- d. None of the above

Your firm has 10,000 bonds outstanding with a par value of \$1,000 each. They have a 7% coupon and the current yield is 10%. What is the annual interest tax shield on these if the tax rate is 34 %?

$$\text{Annual interest tax shield} = 10,000 \times \$1,000 \times .07 \times .34$$

Which of the following statements is most correct?

- a. All else equal, a bond that has a coupon rate of 10 percent will sell at a discount if the required return for a bond of similar risk is 8 percent.
- b. The total return on a bond for a given year consists only of the coupon interest payments received.
- c. Statements a and b are correct.
- d. None of the above.**

## STOCKS

Why would stock analysts issue positive research reports for companies that they dislike?

**Analyst incentives changed with their compensation tied to investment banking.**

In stock valuation, dividend yield plus the capital gains yield equals:

- a. Asset-specific return
- b. Total return**
- c. Beta \* Risk Premium
- d. None of the above.

A stock pays a dividend of \$3.00 next period and has an expected growth rate of 5%. The current discount rate is 11%. What is the current price?

$$P = \$3/.06 = \$50$$

Y2K Technology Corporation has just paid a dividend of \$0.40 per share. The dividends are expected to grow at 30% per year for the next two years and at 5% per year thereafter. If the required rate of return in the stock is 15%, draw a timeline to explain how to calculate the current value of the stock.

**Dividends are yr1:  $\$0.4 \times 1.3 = \$0.52$ ; yr2:  $.52 \times 1.3 = \$0.68$ ; yr3:  $.676 \times 1.05 = \$0.71$**

**Knowing dividend in the third year allows us to calculate the second period price,  $0.71 / (.15 - .05) = \$7.10$ . So we need to discount back  $\$0.68$  from year 1 and  $\$7.78$  ( $0.68 + 7.10$ ) from year 2. The current price is the sum of the discounted cash flows:**

$$P_0 = 0.52/1.15 + 7.78/(1.15^2) = \$6.33$$

The interest tax shield has no value for a firm when:

- I. the tax rate is equal to zero.
  - II. the debt-equity ratio is exactly equal to 1.
  - III. the firm is unlevered.
  - IV. a firm elects 100 percent equity as their capital structure.
- a. I and III only
  - b. II and IV only
  - c. I, III, and IV only**
  - d. II, III, and IV only
  - e. I, II, and IV only

The expected rate of return on the common stock of Northwest Corporation is 14 percent. The stock's dividend is expected to grow at a constant rate of 8 percent a year. The stock currently sells for \$50 a share. Which of the following statements is most correct?

- The stock's dividend yield is 8 percent.
- The stock's dividend yield is 7 percent.
- The current dividend per share is \$4.00.
- The stock price is expected to be \$54 a share in one year.**
- The stock price is expected to be \$57 a share in one year.

$r_s = \text{Dividend yield} + \text{Capital gains}$ .  $14\% = \text{Dividend yield} + 8\%$ ; therefore,  $\text{Dividend yield} = 6\%$ .  
 $\text{Dividend yield} = \text{Dividend}/\text{Price}$ ;  $\text{Dividend} = 0.06 \times \$50 = \$3$ .  $\text{Future stock price} = \$50 \times 1.08 = \$54$ .

A news release stating that a firm will do a seasoned offering generally tends the stock price to:

- increase.
- decrease.**
- remain constant.
- respond but the direction of the response is not predictable as shown in past studies.
- decrease momentarily and then immediately increase substantially within the hour.

## COST OF CAPITAL & CAPITAL STRUCTURE

The optimal capital structure will tend to include more debt for firms with:

- the highest deductions.
- the lowest marginal tax rate.
- substantial tax shields from other sources.
- lower probability of financial distress.**
- less taxable income.

Sally's has debt of \$12,000 and equity of \$18,000. The cost of debt is 8 percent and the cost of equity is 13 percent. The tax rate is 34 percent. What is the firm's weighted average cost of capital?

$$[18k \div (12k + 18k) \times .13] + [12k \div (12k + 18k) \times .08 \times (1 - .34)] = .09912 = 9.91 \text{ percent}$$

Big Bill's Yachts has a debt-equity ratio of .75. The pre-tax cost of debt is 8 percent and the unlevered cost of capital is 13 percent. What is the cost of equity if the tax rate is 35 percent?

$$R_E = .13 + (.13 - .08) \times .75 \times (1 - .35) = .15438 = 15.44 \text{ percent}$$

J&J, Inc. is an all equity firm that has 250,000 shares of stock outstanding. The company is currently negotiating a \$300,000 loan at 7 percent interest. The loan proceeds will be used to repurchase 100,000 shares of the outstanding stock. What is the value of J&J, Inc. if you ignore taxes?

$$\text{Price per share} = \$300,000 \div 100,000 = \$3; \text{Value of firm} = E + D = (250,000 - 100,000) \times \$3 + \$300,000 = \$750,000$$

The Winter Wear Company has expected earnings before interest and taxes of \$2,100, an unlevered cost of capital of 14% and a tax rate of 34%. The company also has \$2,800 of debt that carries a 7% coupon. The debt is selling at par value. What is the value of this firm?

$$V_U = [\$2,100 \times (1 - .34)] \div .14 = \$9,900; V_L = \$9,900 + (.34 \times \$2,800) = \$10,852$$

Griggs Inc. has debt with both a face and a market value of \$3,000. This debt has a coupon rate of 7% and pays interest annually. The expected earnings before interest and taxes is \$1,200, the tax rate is 34%, and the unlevered cost of capital is 12%. What is the firm's cost of equity?

$$V_U = [EBIT \times (1 - T_c)] \div R_U = [\$1,200 \times (1 - .34)] \div .12 = \$6,600$$

$$V_L = V_U + (T_c \times D) = \$6,600 + (.34 \times \$3,000) = \$7,620$$

$$V_L - V_D = V_E = \$7,620 - \$3,000 = \$4,620$$

$$R_E = R_U + (R_U - R_D) \times D/E \times (1 - T_c) = .12 + [(.12 - .07) \times (\$3,000 \div \$4,620) \times (1 - .34)] = .12 + .02143 = .14143 = 14.14 \text{ percent}$$

Walter's Distributors have a cost of equity of 13.84 percent and an unlevered cost of capital of 12%. The company has \$5,000 in debt that is selling at par value. The levered value of the firm is \$12,000 and the tax rate is 34%. What is the pre-tax cost of debt?

$$V_E = \$12,000 - \$5,000 = \$7,000; .1384 = .12 + (.12 - R_D) \times (\$5,000 \div \$7,000) \times (1 - .34); .0184 = .056571 - .471429R_D; R_D = .08097 = 8.10 \text{ percent}$$

You have a health food store with has a D/E ratio of 2/3. A comparable firm, Organic Oats, has a cost of equity of 16% and a D/E ratio of 4/3. The risk-free rate is 4% and the required rate of return on the market is 10%. Assume a tax rate of 25%. What is your cost of equity?

$$16\% = 4\% + \text{beta}(10\% - 4\%) \quad 12\% = \text{beta} \times 6\% \quad \text{beta} = 2$$

$$\text{Unlev beta} = 2/[1 + (1 - .25) \times (4/3)] = 2/2 = 1$$

$$\text{Relever} = 1^*/[1 + (1 - .25) \times (2/3)] = 1.5$$

$$\text{Cost of equity} = 4\% + 1.5 \times 6\% = 13\%$$

Describe the value of a firm as debt increases - in a perfect market (without taxes and distress), with taxes, and with both taxes and distress.

*In a perfect market, firm value is unaffected by the level of debt. With taxes, the value increases with the level of debt. And with both taxes and distress, the benefits of debt (tax shields) are eventually outweighed by the costs of debt (potential distress) so the value initially rises and then decreases with higher level of debt.*

The optimal capital structure:

- will be the same for all firms in the same industry.
- will remain constant over time unless the firm does an acquisition.
- of a firm will vary over time as taxes and market conditions change.**

- d. places more emphasis on the operations of a firm rather than the financing of a firm.
- e. is unaffected by changes in the financial markets.

What is an equity beta?

**The equity beta is the levered beta.**

If a company uses the same discount rate for evaluating all projects, which outcome is likely?

- a. Accepting poor, high-risk projects.
- b. Rejecting good, low-risk projects.
- c. Accepting only good, low-risk projects.
- d. Accepting no projects.
- e. **Answers a and b are correct.**

Kantishna Air is trying to decide whether to open a lodge in Denali National Park. The beta for Kantishna is 1.0. However, other national park backcountry lodges have betas averaging 3 with a debt to equity value of 2/3. Assume the tax rate is 25%. The Kantishna lodge will have a D/E ratio of 1/3 (so the D/V=1/4) and the cost of debt is 8%, the risk premium is 4%, and the risk free rate is 2%, what is the project's weighted average cost of capital?

$$\beta^U = \beta^L / (1 + (1-t)D/E) = 3 / (1 + (1-.25)(2/3)) = 3 / (1 + (3/4)(2/3)) = 3 / 1.5 = 2$$

$$\beta^L = \beta^U * (1 + (1-t)D/E) = 2 * (1 + (1-.25)(1/3)) = 2 * (1 + (3/4)(2/3)) = 2 * 1.25 = 2.5$$

$$E(R) = R_F + \beta * \text{Market Risk Premium} = 2\% + 2.5 * 4\% = 12\%$$

$$\text{WACC} = (1-.25)(1/4)8\% + (3/4)12\% = 10.5\%$$

Glacier Pure Water Inc. has a capital structure of 40 percent debt, 10 percent preferred stock, and 50 percent common equity. The firm's current after-tax cost of debt is 6 percent and both the risk free rate and the risk premium are 5.5%. The firm's preferred stock currently sells for \$80 a share and pays a dividend of \$10 per share. The common stock currently sells for \$40 per share. The beta is 2 and investors expect the dividend to grow indefinitely at a constant rate of 10 percent per year.

What is the firm's cost of newly issued common stock?

$$R_e = .055 + 2 * .055 = 16.5\%$$

What is the firm's cost of newly issued preferred stock?

$$R_p = 10/80 = 12.5\%$$

What is the firm's weighted average cost of capital? Write out equation and clearly show how to solve for WACC.

$$\text{WACC} = .06 * .4 + .165 * .5 + .125 * .1$$