

CORPORATE FINANCE**FINAL EXAM: FALL 1992**

1. You have been asked to analyze the capital structure of DASA Inc, and make recommendations on a future course of action. DASA Inc. has 40 million shares outstanding, selling at \$20 per share and a debt-equity ratio (in market value terms) of 0.25. The beta of the stock is 1.15, and the firm currently has a AA rating, with a corresponding market interest rate of 10%. The firm's income statement is as follows:

| | |
|---------------|---------------|
| EBIT | \$150 million |
| Interest Exp. | \$ 20 million |
| Taxable Inc. | \$130 million |
| Taxes | \$ 52 million |
| Net Income | \$ 78 million |

The current riskfree rate is 8% and the market risk premium is 5.5%.

- What is the firm's current weighted average cost of capital? (1 point)
- The firm is proposing borrowing an additional \$200 million in debt and repurchasing stock. If it does so its rating will decline to A, with a market interest rate of 11%. What will the Weighted average cost of capital be if they make this move? (1 point)
- What will the new stock price be if they borrow \$200 million and repurchase stock (assuming rational investors)? (1 point)
- Now assume that the firm has another option to raise its debt/equity ratio (instead of borrowing money and repurchasing stock). It has considerable capital expenditures planned for the next year (\$150 million). The company also pays \$1 in dividends per share currently (Current Stock Price=\$20). If the company finances all its capital expenditures with debt and doubles its dividend yield from the current level for the next year, what would you expect the debt/equity ratio to be at the end of the next year. (3 points)

2a. RYBR Inc., an all-equity firm, has net income of \$100 million currently and expects this number to grow at 10% a year for the next three years. The firm's working capital increased by \$10 million this year and is expected to increase by the same dollar amount each of the next three years. The depreciation is \$50 million and is expected to grow 8% a year for the next three years. Finally, the firm plans to invest \$60 million in capital expenditure for each of the next three years. The firm pays 60% of its earnings as dividends each year. RYBR has a cash balance currently of \$50. Assuming that the cash does not earn any interest, how much would you expect to have as a cash balance at the end of the third year? (2 points)

b. Assume that RYBR had financed 20% of its reinvestment needs with debt, estimate the cash balance at the end of the third year. (2 points)

c. Now assume that stockholders in RYBR are primarily corporations. They are exempt from ordinary taxes on 85% of the dividends that they receive (Ordinary tax rate=30%), and pay capital gains on price appreciation at a 20% rate. If RYBR pays a dividend of \$2 per share, how much would you expect the stock price change to be on the ex-dividend date? (2 points)

3. LOB Inc. is a firm with the following characteristics:

| Year | 1 | 2 | 3 | After year 3 |
|--------------------|------|------|------|--------------|
| Growth rate in EPS | 20% | 16% | 12% | 6% |
| ROC | 20% | 20% | 16% | 12% |
| D/E | 0% | 10% | 25% | 50% |
| i | NA | 8% | 8% | 8% |
| Beta | 1.40 | 1.25 | 1.15 | 1.00 |

The firm has EPS currently of \$2.00. The tax rate is 40%. The current riskfree rate is 6.5%. The tax rate is 40%. (The market risk premium is 5.5%)

- a. What would you project the EPS and DPS to be for the next three years? (2 points)
- b. What is the terminal price (at the end of the third year)? (2 points)
- c. What is your best estimate for the DDM Value per share? (2 points)

Corporate Finance: Final Exam: Fall 1993

1. You are a corporate finance analyst at a management consulting firm, which has been approached by a company for advice on its capital structure decisions. The company, Boston Turkey Inc., has been in existence for only two years, and its stock is currently trading at \$20 per share (There are 100,000 shares outstanding.) The following are the most recent financial statements of the company:

Income Statement

| | |
|--------------------|-------------------|
| Revenues | \$ 1,000,000 |
| - Expenses | \$ 400,000 |
| - Depreciation | <u>\$ 100,000</u> |
| EBIT | \$ 500,000 |
| - Interest Expense | <u>\$ 100,000</u> |
| Taxable Income | \$ 400,000 |
| - Tax | <u>\$ 160,000</u> |
| Net Income | \$ 240,000 |

Balance Sheet

| <i>Assets</i> | | <i>Liabilities</i> | |
|-----------------------------|---------------------|--------------------|---------------------|
| Property, Plant & Equipment | \$ 1,500,000 | Accounts Payable | \$ 500,000 |
| Land & Buildings | \$ 500,000 | Long Term Debt | \$ 1,000,000 |
| Current Assets | <u>\$ 1,000,000</u> | Equity | <u>\$ 1,500,000</u> |
| Total | \$ 3,000,000 | Total | \$ 3,000,000 |

The debt is not traded, but its estimated market value is 125% of face (book) value.

Due to its limited history, the beta of the stock cannot be estimated from past prices. You do have information about comparable listed firms and their betas --

| <i>Firm</i> | <i>Beta</i> | <i>Debt/Equity Ratio</i> |
|------------------------|-------------|--------------------------|
| Kentucky Fried Chicken | 1.05 | 20% |
| Hardee's | 1.20 | 50% |
| Popeye's Fried Chicken | 0.90 | 10% |

Roy Rogers

1.35

70%

(The comparable firms all have the same tax rate as Boston Turkey). You can assume that the market risk premium is 5.5%.

As general information, you have also collected data on interest coverage ratios, ratings and interest rate spreads, and they are summarized below:

| <i>Rating</i> | <i>Interest Cov. Ratio gt.</i> | <i>and Cov. Ratio lt.</i> | <i>Spread over T-bond</i> |
|---------------|------------------------------------|-------------------------------|-------------------------------|
| AAA | 9.65 | ∞ | 0.30% |
| AA | 6.85 | 9.35 | 0.70% |
| A+ | 5.65 | 6.849999 | 1.00% |
| A | 4.49 | 5.649999 | 1.25% |
| A- | 3.29 | 4.489999 | 1.50% |
| BBB | 2.76 | 3.289999 | 2.00% |
| BB | 2.17 | 2.759999 | 2.50% |
| B+ | 1.87 | 2.169999 | 3.00% |
| B | 1.57 | 1.869999 | 4.00% |
| B- | 1.27 | 1.569999 | 5.00% |
| CCC | 0.87 | 1.269999 | 6.00% |
| CC | 0.67 | 0.869999 | 7.50% |
| C | 0.25 | 0.669999 | 9.00% |
| D | -100000 | 0.249999 | 12.00% |

The treasury bill rate is 3.00% and the treasury bond rate is 6.25%.

- What is the current cost of equity?
- What is your best estimate of the current after-tax cost of debt? (The company is not rated currently)
- What is the current cost of capital?

As part of your analysis, you are examining whether Boston Turkey should borrow \$500,000 and buy back stock. If it does so, its rating will drop to A-.

d. If it does so, what will the new cost of equity be?

e. How much will the stock price change if it borrows \$500,000 and buys back stock?

2. Boston Turkey was so impressed with your grasp of capital structure basics that they have come back to you for some advice on dividend policy. To save you the trouble of having to refer back to page 1, the latest financial statements are reproduced on this page.

Income Statement

| | |
|--------------------|-------------------|
| Revenues | \$ 1,000,000 |
| - Expenses | \$ 400,000 |
| - Depreciation | <u>\$ 100,000</u> |
| EBIT | \$ 500,000 |
| - Interest Expense | <u>\$ 100,000</u> |
| Taxable Income | \$ 400,000 |
| - Tax | <u>\$ 160,000</u> |
| Net Income | \$ 240,000 |

Balance Sheet

| <i>Assets</i> | | <i>Liabilities</i> | |
|-----------------------------|---------------------|-------------------------|---------------------|
| Property, Plant & Equipment | \$ 1,500,000 | Accounts Payable | \$ 500,000 |
| Land & Buildings | \$ 500,000 | Long Term Debt | \$ 1,000,000 |
| Current Assets | <u>\$ 1,000,000</u> | Equity (100,000 shares) | <u>\$ 1,500,000</u> |
| Total | \$ 3,000,000 | Total | \$ 3,000,000 |

Boston Turkey expects its revenues to grow 10% next year, and its expenses to remain at 40% of revenues. The depreciation and interest expenses will remain unchanged at \$100,000 next year. The working capital, as a percentage of revenue, will remain unchanged next year.

The managers of Boston Turkey claim to have several projects available to choose from next year, where they plan to invest the funds from operations, and suggest that the firm really should not be paying dividends. The projects have the following characteristics --

| Project | Equity Investment | Expected Annual CF to Equity | Beta |
|---------|-------------------|------------------------------|------|
|---------|-------------------|------------------------------|------|

| | | | |
|---|------------|--------|------|
| A | \$ 100,000 | 12,500 | 1.00 |
| B | \$ 100,000 | 14,000 | 1.50 |
| C | \$ 50,000 | 8,000 | 1.80 |
| D | \$ 50,000 | 12,000 | 2.00 |

The treasury bill rate is 3% and the treasury bond rate is 6.25%. The firm plans to finance 40% of its future net capital expenditures (Cap Ex - Depreciation) and working capital needs with debt.

- How much can the company afford to pay in dividends next year?
- Now assume that the firm actually pays out \$1.00 per share in dividends next year. The current cash balance of the firm is \$150,000. How much will the cash balance of the firm be at the end of next year, after the payment of the dividend?
- The average investor in Boston Turkey is a wealthy individual, who pays 40% in taxes on ordinary income and only 28% on capital gains. How much would you expect the price to drop on the ex-dividend day, if the company pays out \$1 per share as dividend?

3. You are now trying to value Boston Turkey. For purposes of simplicity, the relevant information about the company is reproduced here --

Current Numbers:

| | |
|----------------------------------|------------------------------------|
| Earnings per share = \$ 2.40 | Net Income = \$240,000 |
| Dividends per share = \$ 1.00 | Interest Expenses = \$100,000 |
| Market price per share = \$ 20 | Book Value of Debt = \$1,000,000 |
| Number of shares = 100,000 | Book Value of Equity = \$1,500,000 |
| Market Value of Debt = 1,250,000 | Tax Rate = 40% |

Due to its limited history, the beta of the stock cannot be estimated from past prices. You do have information about comparable listed firms and their betas --

| <i>Firm</i> | <i>Beta</i> | <i>Debt/Equity Ratio</i> |
|------------------------|-------------|--------------------------|
| Kentucky Fried Chicken | 1.05 | 20% |
| Hardee's | 1.20 | 50% |
| Popeye's Fried Chicken | 0.90 | 10% |
| Roy Rogers | 1.35 | 70% |

(The comparable firms all have a tax rate of 40%)

[This is the same information you were given in problem 1. You can use the beta estimated from that section in this problem.]

- a. Assuming that these numbers are sustainable for the next three years, what is the expected growth rate in earnings per share for this period?
- b. The growth rate after year 3 is expected to be 6% forever. What will the price per share be at the end of year 3?
- c. What is the value per share using the dividend discount model?

Corporate Finance: Final Exam - Fall 1994

General Information

The current treasury bond rate is 8.00%. All the questions in this exam relate to the company described in problem 1. You can use information across problems.

1. Jackson-Presley Inc. is a small company in the business of producing and selling musical CDs and cassettes and it is also involved in promoting concerts. The company last two reported income statements indicate that the company has done very well in the last two years –

| | <i>Last Year</i> | <i>Current Year</i> |
|------------------------------------|------------------|---------------------|
| Revenues | \$ 100 million | \$150 million |
| - Cost of Goods Sold | \$ 40 million | \$ 60 million |
| - Depreciation & Amortization | \$ 10 million | \$ 13 million |
| Earnings before interest and taxes | \$ 50 million | \$ 85 million |
| Interest Expenses | \$ 0 | \$ 5 million |
| Taxable Income | \$ 50 million | \$ 80 million |
| Taxes | \$ 20 million | \$ 32 million |
| Net Income | \$ 30 million | \$ 48 million |

The company's current balance sheet also provides an indication of the company's health:

| <i>Assets</i> | | <i>Liabilities</i> | |
|-----------------------------|----------------|---------------------|---------------|
| Property, Plant & Equipment | \$ 100 million | Current Liabilities | \$ 20 million |
| Land and Buildings | \$ 50 million | Debt | \$ 60 million |
| Current Assets | \$ 50 million | Equity | \$120 million |
| Total | \$ 200 million | Total | \$200 million |

Jackson-Presley's stock has been listed on the NASDAQ for the last two years and is trading at twice the book value (of equity). There are 12 million shares outstanding. Jackson-Presley derives 75% of its total market value from its record/CD business and 25% from the concert business. While the price data on the company is insufficient to estimate a beta, the betas of comparable firms in these businesses is as follows –

Comparable Firms

| <i>Business</i> | <i>Average Beta</i> | <i>Average D/E Ratio</i> |
|--------------------|---------------------|--------------------------|
| Record/CD Business | 1.15 | 50.00% |

- The equity is trading in the market at two times the book value. The debt is composed of ten-year bonds, and is rated A (Typical A rated bonds are yielding 10% currently in the market).
- Assume that Jackson-Presley intends to maintain its working capital at the same percentage of revenues for the next year, as it has this year.
- Also assume that the following is the listing of the major investment opportunities that Jackson-Presley has for the next year.

| <i>Project</i> | <i>Total Investment</i> | <i>IRR on project (using CF to Equity)</i> | <i>Beta (Levered)</i> |
|----------------|-------------------------|--|-----------------------|
| A | \$ 15 million | 16% | 1.60 |
| B | \$ 30 million | 15% | 1.25 |
| C | \$ 25 million | 12.5% | 1.0 |
| D | \$ 20 million | 11.5% | 0.5 |

- If revenues, net income and depreciation are all expected to grow 20% next year, and the firm maintains its existing debt financing mix (in market value terms), how much can the firm afford to pay out as dividends after meeting working capital and capital budgeting needs? (5 points)
 - The company's current cash balance is \$10 million. What will happen to this cash balance if Jackson-Presley maintains its payout ratio at 25% next year? (1 point)
3. The managers at Jackson-Presley also believe that they are significantly undervalued, and want you to estimate how much the equity in the firm is truly worth. They provide you with the following additional information –
- They believe that they can maintain 'high growth' for the next five years.
 - The beta calculated, using comparable firms, in problem 1b, is a good estimate of the beta for the next five years.
 - The dividend payout ratio will be maintained at 25% for the high-growth period.
 - The current (from the current income statement and balance sheet) return on capital, debt equity ratio and interest rate will be maintained for the high growth period. (The book value of equity at the beginning of the year was \$ 100 million but the book value of debt is unchanged...)

- There are 12 million shares outstanding.
 - After the high-growth period, the earnings growth rate is expected to drop to 6%, and the firm's return on capital will also drop to 15%. The debt equity ratio and interest rate are expected to remain unchanged. The beta is expected to be 1.00 in the stable growth period.
- a. Estimate the expected growth rate in the high growth period. (2 points)
 - b. Estimate the expected dividends in the high growth period. (1 point)
 - c. Estimate the expected payout ratio in the stable growth phase. (2 points)
 - d. Estimate the terminal price (at the end of the high-growth period) (2 points)
 - e. Estimate the value today from the dividend discount model. (1 point)
4. Jackson-Presley is now planning a major restructuring involving the following actions
- A division, producing records and cassettes, will be sold for \$ 50 million. That division is currently earning \$ 5 million before interest and taxes. As mentioned in problem 1, comparable firms in this business have an average beta of 1.15 and an average debt/equity ratio of 50%.
 - The cash from the sale of the divisions will be used to buy back stock.
 - The dividend payout ratio will be reduced to 15%.
- a. Estimate the new growth rate in earnings, after the restructuring, using fundamentals. (4 points)
 - b. Estimate the new cost of equity for Jackson-Presley after the restructuring. (4 points)

Corporate Finance: Final Exam: Fall 1995

Answer all questions on the exam. If you have additional work, please attach the work.

1. SDL is a firm manufacturing perfumes and other cosmetics and it sells its products world wide. The financial statements for the most recent two years are included below.

Income Statements

(All figures in millions)

| | <i>1993</i> | <i>1994</i> |
|----------------------|-------------|-------------|
| Revenues | \$ 150.00 | \$ 200.00 |
| - Operating Expenses | \$ 115.00 | \$ 140.00 |
| - Depreciation | \$ 10.00 | \$ 20.00 |
| = EBIT | \$ 25.00 | \$ 40.00 |
| - Interest Expenses | \$ 5.00 | \$ 6.50 |
| = Taxable Income | \$ 20.00 | \$ 33.50 |
| - Taxes | \$ 5.00 | \$ 13.50 |
| = Net Income | \$ 15.00 | \$ 20.00 |

Balance Sheets (in millions)

| | <i>1993</i> | <i>1994</i> | | <i>1993</i> | <i>1994</i> |
|----------------|-------------|-------------|---------------------|-------------|-------------|
| Fixed Assets | \$150 | \$175 | Current Liabilities | \$40 | \$50 |
| Current Assets | \$60 | \$75 | Debt | \$90 | \$100 |
| | | | Equity | \$80 | \$100 |
| <i>Total</i> | \$ 210 | \$ 250 | <i>Total</i> | \$ 210 | \$250 |

In addition, you are provided the following information –

- The long-term treasury bond rate is 6%.
- There are 10 million shares outstanding, trading at \$ 40 per share currently; the stock has been traded for only two years. A regression of stock returns against market returns yields a beta of 0.9, with a standard error of 0.8. There are, however, five cosmetics firms which are publicly traded, with the following estimates of betas for each.

| <i>Company</i> | <i>Beta</i> | <i>D/E Ratio</i> |
|----------------|-------------|------------------|
| Alberto Culver | 0.85 | 10% |
| Avon Products | 1.3 | 40% |
| Gillette | 1.25 | 25% |
| Helen of Troy | 0.95 | 15% |
| Helene Curtis | 0.85 | 20% |

All these firms face a marginal tax rate of 40%.

- The debt on the balance sheet has two components. The first is traded bonds, with ten years to expiration and a coupon rate of 7%; there are 50,000 bonds outstanding, trading at \$ 850 apiece (the face value is \$ 1000). The second is \$50 million in bank debt, which also has a ten year maturity, and carries an interest rate of 6%.

a. Estimate the cost of equity for SDL Inc. (2 points)

b. Estimate the market value of debt and the after-tax cost of debt for SDL Inc.

c. Estimate the cost of capital for this firm. (1 point)

d. Assume that you have regressed SDL's firm value over the last 8 quarters against long term rates, GNP growth and the DM (SDL's overseas sales are primarily in Europe) and have arrived at the following results –

Change in firm value = 0.11 - 1.50 (Change in Long Term Interest Rate)

Change in firm value = 0.18 + 0.50 (GNP Growth)

Change in firm Value = 0.15 - 0.26 (US \$ /DM Currency Rate)

Does SDL's current debt mix (ten-year \$ debt) fit its needs? If so, why? If not, why not?

How would you change the debt mix to fit their firm characteristics? (2 points)

e. Assume that this firm decides to do an acquisition of XLNT Inc, a specialty retailer, who sells primarily cosmetics. XLNT has an estimated market value of equity of \$ 150 million, a beta of 1.25 and no debt outstanding. The acquisition will be financed entirely with debt, which will result in the rating for SDL dropping to BBB; typical BBB rated bonds currently carry an interest rate of 9.5%. Estimate SDL's cost of capital after this acquisition. (4 points)

2. VRF Inc. is a well-established firm that manufactures automobile components, and has a long and venerable history. It has come to you for advice on dividend policy, and it

provides you with the following information for 1994 (which is its most recent year of financial data)–

- In 1994, it had revenues of \$1,000 million and made a net income of \$ 150 million; it had a book value of equity of \$ 1.5 billion.
- It had capital expenditures of \$ 175 million in 1994, and depreciation of \$ 100 million.
- The working capital increased from \$80 million in 1993 to \$100 million in 1994.
- The firm did not have debt outstanding at any time during the year.
- The firm's cash balance increased by \$ 25 million from 1993 to 1994, after the payment of dividends for the period.

a. How much did the company pay out as dividends during 1994? (4 points)

b. Assume now that you are trying to estimate how much it should pay out as dividends during 1995, and that you are given the following additional information –

- The revenues and earnings are expected to grow 10% from 1994 levels.
- The working capital is expected to remain at the same percent of revenues as in 1994.
- The depreciation is expected to grow at the same rate as earnings, but the firm has broken out its expected capital expenditures by division for 1995–

| Division | Cap Ex Needs | Return on Equity | Beta |
|----------|---------------|------------------|------|
| A | \$ 75 million | 13% | 1.00 |
| B | \$ 50 million | 16% | 2.00 |
| C | \$ 65 million | 12% | 0.80 |
| D | \$ 60 million | 15% | 1.10 |

The long term bond rate is 6%, and the beta of the stock is 1.05. The market risk premium is 5.5%.

- The firm also plans to raise 20% of its net capital expenditure and working capital needs from debt.

Should it make all its scheduled capital expenditures? Assuming that you can reevaluate these capital expenditures, how much cash does the firm have available to return to stockholders in 1995? (5 points)

3. You are trying to value a company using the dividend discount model. You have collected the following information on the firm –

- The company has earnings per share currently of \$2.00, and pays 20% of its earnings as dividends. Its book value of equity per share is \$10.00, and it is trading at 2.5 times the book value.
- The firm has no leverage currently, and is expected maintain this policy for the high growth phase, which is expected to last 3 years. During the high growth phase, the beta is expected to be 1.5.
- After 3 years, the firm is expected to reach stable growth and earnings are expected to grow 6% a year. The fundamentals are expected to approach industry averages for return on capital (where the average is 14%), leverage (where the industry average debt/equity ratio is 25%) and unlevered beta (where the industry average unlevered beta is 0.8).

The long term treasury bond rate is 6%.

- a. Estimate the expected growth rate during the high growth period. (2 points)
- b. Estimate the terminal value per share at the end of the high growth period.
- c. Estimate the value per share using the dividend discount model. (3 points)

Corporate Finance: Final Exam - Spring 1996*Aswath Damodaran*

This exam is worth 30 points. Please answer all questions.

1. You have been hired by Samson Corporation, a mid-size company which manufactures luggage to assess their capital structure. You have been provided with the most recent income statement and balance sheet for the company –

Income Statement

| | |
|----------------------|--|
| Revenues | \$ 100 million |
| - Cost of Goods Sold | \$ 60 million (Includes depreciation of \$ 10 million) |
| = EBIT | \$ 40 million |
| - Interest Expenses | \$ 6 million |
| = Taxable Income | \$ 34 million |
| - Taxes | \$ 13.6 million |
| = Net Income | \$ 20.4 million |

Balance Sheet

| <i>Assets</i> | | <i>Liabilities</i> | |
|----------------|----------------|---------------------|---------------|
| Fixed Assets | \$ 100 million | Current Liabilities | \$ 20 million |
| Current Assets | \$ 40 million | Debt | \$ 60 million |
| | | Equity | \$ 60 million |

The company had 10 million shares outstanding trading at \$24 per share. Nearly 40% of the outstanding stock is held by the founding family. You are also provided with the following additional information –

- A regression of returns on the stock against a market index over the last 5 years yields a beta of 0.90, but Samson had no debt for the first four out of the five years. Its debt ratio in the fifth year was similar to its current debt ratio.
 - The debt is 10-year bank debt; however, based on its interest coverage ratio the firm would be rated AA and carry a market interest rate of 10%. The treasury bond rate is 8% and the market risk premium is 5.5%.
- a. Estimate the current cost of equity for Samson Corporation. (2 points)
- b. Estimate the current weighted average cost of capital for Samson Corporation (2 points).

c. Assume now that Samson Corporation plans to double its debt ratio. The bond rating is expected to drop to BBB, with a market interest rate of 11.5%. Estimate the new cost of capital. (2 points)

d. If Samson does decide to double its debt capacity immediately by buying back stock, estimate the dollar debt it would need to borrow. (1 point)

e. If Samson decides to double its debt ratio over the next 3 years, and plans to use the new debt to finance new projects, estimate the total dollar debt that the firm will have to issue over the next 3 years. (Samson pays no dividends) (3 points)

f. Based upon the most recent financial data, would you suggest that Samson take projects with the debt or return cash to stockholders. Explain. (You can assume that the book value of equity was \$ 40 million at the beginning of the year, while the book value of debt was \$ 60 million) (1 point)

2. You have been asked by Jupiter Corporation, a toy manufacturer, for advice on dividend policy. Jupiter Corporation had net income of \$ 150 million in 1995 and reported depreciation of \$ 20 million. Its balance sheets for 1994 and 1995 are provided below (in millions):

| | <i>Assets</i> | | <i>Liabilities</i> | | |
|-------------------------|---------------|-------------|---------------------|-------------|-------------|
| | <i>1994</i> | <i>1995</i> | | <i>1995</i> | <i>1995</i> |
| Net Fixed Assets | \$750 | \$ 800 | Current Liabilities | \$50 | \$60 |
| Current Assets | | | Debt | \$ 200 | \$ 215 |
| Cash | \$ 50 | \$ 100 | Equity | \$ 650 | \$ 720 |
| Non-cash Current Assets | \$100 | \$ 120 | | | |

a. Estimate how much Jupiter paid out as dividends during 1995.(2 points)

b. Estimate how much capital expenditure Jupiter Corporation had in 1995. (1 point)

c. Now assume that you have been given the following information on next year's projections for Jupiter Corporation.

- Net Income, depreciation and non-cash working capital are expected to increase 10% from 1995 levels.
- The firm has four projects that it is considering for next year

| Project | EBIT | Investment | Beta |
|---------|------|------------|------|
|---------|------|------------|------|

| | | | |
|---|-----------------|---------------|------|
| A | \$ 6.67 million | \$ 30 million | 1.20 |
| B | \$ 3.33 million | \$ 20 million | 1.00 |
| C | \$4.17 million | \$ 20 million | 1.10 |
| D | \$ 8.33 million | \$ 35 million | 2.00 |

Assume that the firm plans to finance these projects at a debt to capital ratio of 25%, and that the cost of debt is 8% (Corporate tax rate = 40%), and that the treasury bond rate is 7%. Estimate how much Jupiter can afford to pay out next year as dividends. (4 points)

3. You are trying to value Wee-Growth, a firm that manufactures children's software using the dividend discount model. In the most recent year, Wee-Growth had earnings per share of \$ 3.00, dividends per share of \$ 1.00 and a beta of 1.30. In the same year, the firm also had a return on capital of 25%, a debt-equity ratio of 25% and paid an interest rate of 8% on its debt. (Its corporate tax rate was 40%.) Over the next 3 years, Wee-Growth expects to maintain its existing dividend payout ratio, return on capital, debt-equity ratio and pre-tax interest rate. After year 3, the firm expects its beta to drop to 1, its return on capital to move to the industry average of 15% and its leverage to remain unchanged. The treasury bond rate is 7%.

- Estimate the expected growth over the next 3 years. (2 points)
- Estimate the expected dividends per share over the next 3 years. (1 point)
- Estimate the terminal price (at the end of the third year). (3 points)
- Estimate the value per share today. (1 point)
- Assume now that you had valued Wee-Growth also using the FCFE model. The capital expenditure per share in the most recent year was \$ 2.50, whereas the depreciation was \$ 1.00 per share. Assuming that these grow at the same rate as earnings for the next 3 years, and that they offset each other after 3, estimate the value per share. [There are no working capital requirements] (4 points)

Corporate Finance: Final Exam - Spring 1997

This exam is worth 25% and you have 2 hours.

1. Solo Corporation, a manufacturer of surf boards, has asked for your advice on whether to invest \$ 40 million in a new line of beach products:

- The investment will yield earnings before interest and taxes of \$ 10 million a year, and any depreciation on the project will be invested back into the project as capital maintenance expenditure. There will be no working capital investments.
- The project is expected to have an infinite life.
- The company has a beta of 1.2, but this project is expected to have a beta of 1.5. The firm will maintain its existing financing mix of 60% equity and 40% debt. The cost of borrowing is 10%.
- The tax rate for the company, including California State taxes, is 40%. The ten-year bond rate is 7%.

Calculate the NPV of this project.

(3 points)

2. VRC Inc., a privately-owned business in several business lines, wants to estimate a cost of equity for itself as a business. The company provides you with the following information on the businesses it operates in, the operating income it has in each business and the betas of comparable firms in each business line

| Business Line | Operating Income | Comparable Firms | |
|--------------------|------------------|------------------|-----------|
| | | Beta | D/E Ratio |
| Technology | \$ 50 million | 1.60 | 10% |
| Auto Parts | \$ 40 million | 1.20 | 30% |
| Financial Services | \$ 60 million | 1.15 | 100% |

Assuming that the tax rate for all firms is 40%, that the operating income is proportional to divisional value and that VRC has a debt to capital ratio of 40%, estimate the equity beta for VRC.

(4 points)

3. SynerMedia Inc., a entertainment and media corporation, with 50 million shares trading at \$ 40 per share, and no debt, announces that it will borrow \$ 500 million and buy back \$ 500 million worth of stock. The stock price immediately jumps to \$ 44 per

share. If the beta before the stock buy back was 0.80, estimate the interest rate paid on the new debt. (The T.Bond rate is 7% and the company has a tax rate of 40%) (5 points)

4a. DelCash Inc., a discount retailer, has declared and paid a dividend of \$ 500 million this year. You notice, looking over their financial statements, that they have net income of \$ 2 billion for this year, and that the cash balance for the firm increased by \$ 250 million. If the non-cash working capital was unchanged over the year, and the firm finances 30% of its net capital expenditures from debt, estimate the net capital expenditures that DelCash had during the year. (2 points)

4b. On the ex-dividend day, the stock price of Del Cash dropped by \$ 1.80. If the typical stockholder in Del Cash paid 40% on dividend income and 20% on capital gains taxes, estimate the number of shares outstanding in the firm. (2 points)

5. PlayMania, a company that manufactures play equipment for children, has called you in as a value consultant.

- The company has made and expects to continue to make a return on equity of 15% on its projects, and the beta of the stock is 1.
- It pays out 60% of its earnings as dividends, and the firm views itself as stable.
- The company has earnings per share of \$ 2.00 in the current year.
- The T.Bond rate is 7%

a. Estimate the equity value per share of this company. (2 points)

b. The company is planning to increase capital expenditures and lower its payout ratio to 50%. In doing so, it will also be taking projects with lower returns, resulting in a return on equity to 14%. Assuming that it can sustain this payout ratio and return on equity forever, estimate the value of equity per share. (3 points)

6. Answer the following true or false questions on valuation (1 points each)

1. Increasing the debt ratio of a firm will increase the value of the firm.

TRUE FALSE

2. The FCFE value per share for a firm will always be greater than the dividend discount model.

TRUE FALSE

3. When a firm increases its return on assets, without affecting its riskiness, it will increase the value of the firm.

TRUE FALSE

4. The value of a firm can never be lower than the value of the equity in the firm.

TRUE FALSE

Final Exam: Spring 1998

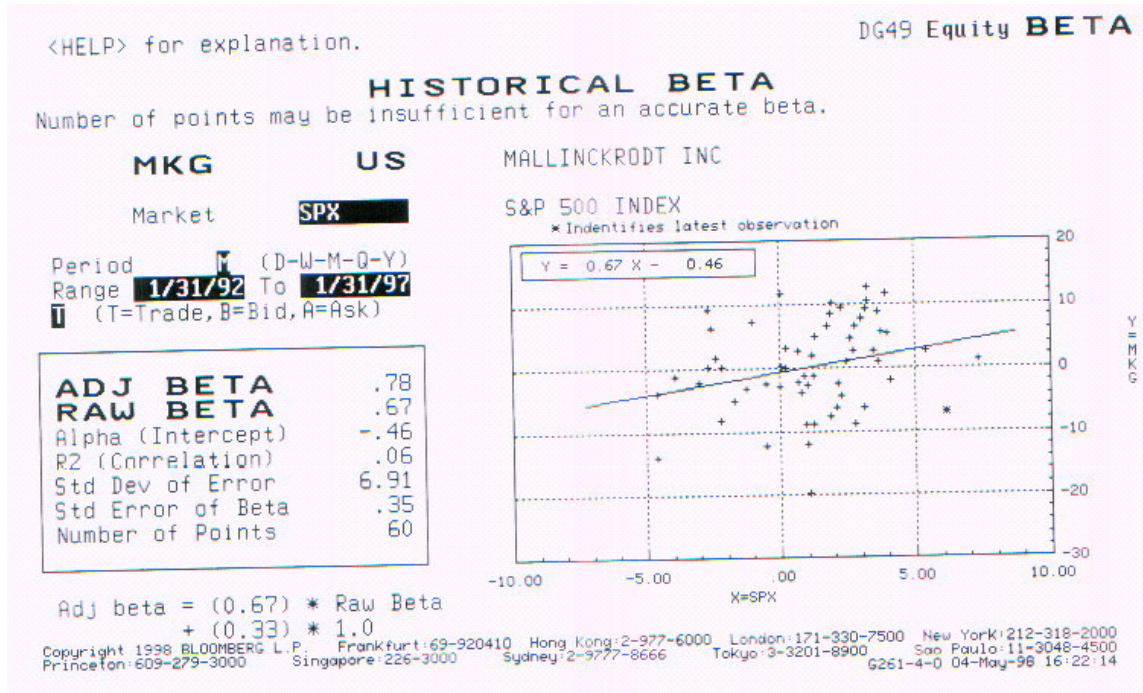
All of the questions in this exam relate to a company called Mallinckrodt, which is headquartered in St. Louis, Missouri, and is a company involved in pharmaceuticals and specialty chemicals. The stock of the company, traded on the NYSE, is at a 52-week low of \$ 32 per share. The CEO of the company, Mr. Ray Holman, has invited you to come in and do a corporate financial analysis of the firm, and has offered to pay you handsomely for your services.

- Page 13 of this report has the income statements and balance sheets for the last 2 years
- Page 14 of this exam has the statement of cash flows for the last 4 years
- Page 15 has a summary table of interest coverage ratios, ratings and default spreads that you might find useful.
- Page 16 has industry averages for betas, debt to equity ratios, returns on equity and capital, and capital expenditure/depreciation for the two segments that Mallinckrodt is in - pharmaceuticals and specialty chemicals.

Additional Notes

- You can ignore the preferred stock in the firm for your calculations.
- Use a market risk premium of 5.5% throughout this analysis.
- The long term treasury bond rate through out this analysis can be set at 6%.

- The following is the Bloomberg regression output, using returns from 1992 to 1997 for Mallinckrodt.



a. If the long term treasury bond rate today is 6%, estimate the cost of equity for Mallinckrodt, based upon the raw beta for the firm. (1 point)

b. Mallinckrodt operates in two different business segments - pharmaceuticals and specialty chemicals. In 1997, the two businesses had the following operating income:

| <i>Business Segment</i> | <i>Operating Income</i> |
|-------------------------|--------------------------|
| Pharmaceuticals | \$ 255.4 Million |
| Specialty Chemicals | \$ 51.5 Million |
| Total | \$ 306.90 Million |

Based upon the industry averages reported on page 16 for the two segments, estimate the bottom-up unlevered beta for Mallinckrodt. (2 points)

c. Mallinckrodt has 73 million shares outstanding today, trading at \$ 32 per share. Assuming that the book value of debt on its books, which is \$ 556.90 Million, is equal to market value (of debt), estimate the bottom-up levered beta for Mallinckrodt. The firm has a marginal tax rate of 40%. (2 points)

- 2 a. Estimate the return on equity earned by Mallinckrodt in the 1997 financial year, based upon average book value of equity between 1996 and 1997. (1 point)
- b. Assuming that the beta of 0.67 shown on the Bloomberg sheet is correct and that the long term treasury bond rate is 6%, estimate the equity EVA earned by Mallinckrodt in 1997. (1 point)
- c. You are now given a further breakdown of capital by division for Mallinckrodt. The pharmaceutical division had pre-tax operating income (EBIT) last year of \$ 255.40 million last year, and had \$1,298 million in book value of capital assigned to it. Assuming that the divisions have the same market debt to capital ratios as the parent company [Mallinckrodt has 73 million share outstanding today, trading at \$ 32 per share and \$ 556.90 Million in debt outstanding (book as well as market)], estimate the EVA earned at this division. The firm is not rated, but its rating can be estimated from its current interest coverage ratio. (The tax rate is still 40%) (2 points)
3. You have estimated the optimal debt to capital ratio for Mallinckrodt, based upon minimizing the cost of capital, to be 40%.
- a. Estimate the current cost of capital for Mallinckrodt, assuming that the beta for the stock is correctly estimated at 0.67, the cost of debt is based upon the rating estimated from the interest coverage ratio and the long term treasury bond rate is 6%. Mallinckrodt has 73 million shares outstanding today, trading at \$ 32 per share and \$ 556.90 million in debt outstanding (book as well as market). (1 point)
- b. At the optimal debt to capital ratio of 40%, Mallinckrodt has an interest coverage ratio of 3.54. Estimate the cost of capital at the optimal debt ratio.
- c. The current debt of the firm is composed of short term debt of \$ 11.70 million, and 5-year maturity debt of \$ 545.20 million. The former debt has a duration of 0.5 years, and the latter has a duration of 3 years. You have run a regression of changes in firm value against changes in long term interest rates:
- $$\text{Change in Firm Value} = 0.50 - 6.5 \text{ Change in long term rates}$$
- Assuming that you decide to move to the optimal of 40% by borrowing money and buying back stock immediately, what should the duration of the new debt be?

- 4 a. To look at the firm's dividend policy, you look at Mallinckrodt's financial statements for the last 2 years. Based upon the income statement, balance sheet and statement of cash flows, estimate the FCFE in each of the last two years. (You can ignore other non-cash adjustments and cash from the disposal of assets each year)
- b. Using the statement of cash flows provided, estimate the percentage of the FCFE that was returned to stockholders (in the form of dividends and stock buybacks) in 1996 and 1997. (1 point)
- c. You have run a regression of dividend yields of pharmaceutical firms on after-tax return on capital and net capital expenditures as a percent of revenues.

$$\text{Dividend Yield} = 0.03 - 0.053 (\text{Return on Capital}) - 0.15 (\text{Net Cap Ex/Revenues})$$

where

- $\text{Return on Capital} = \text{EBIT} (1-t) / (\text{Last year's Book Value of Debt} + \text{Last year's Book Value of Equity})$
- $\text{Net Cap Ex/ Revenues} = (\text{Capital Expenditures} - \text{Depreciation}) / \text{Revenues}$

Mallinckrodt paid dividends of \$ 0.66 per share in 1997, and the stock price is \$ 32.

Based upon this regression, estimate how much Mallinckrodt should pay in dividends per share. (2 points)

- 5 Mallinckrodt reported earnings before interest and taxes of \$307 million in 1997. Capital expenditures were \$170 million in that year, and depreciation was \$ 128 million; Revenues were \$1,861 million. Non-cash working capital is expected to remain at the same percentage of revenues that it was in 1997. (Non-cash Working Capital = Inventories + Accounts Receivable - Accounts Payable).
- a. Assuming that revenues, operating income and net capital expenditures are expected to grow 10% a year for the next 3 years, estimate the cash flow to the firm each year for the next 3 years. (2 points)
- b. After year 3, revenues and operating income will grow 3% a year. Assuming that capital expenditures as a percent of depreciation will drop to the pharmaceutical industry average after year 3, and that non-cash working capital will remain at the same percent of revenues after year 3 (as it is currently), estimate the terminal value of the firm. (The debt ratio of the firm is expected to rise to 40%, the beta to 1.00 and the pre-tax cost of debt will be 7.00%) (2 points)

c. Assume that the current beta for the stock is correctly estimated at 0.67, the current cost of debt is based upon the rating estimated from the interest coverage ratio and the long term treasury bond rate is 6%. Mallinckrodt has 73 million shares outstanding today, trading at \$ 32 per share and \$ 556.90 Million in debt outstanding (book as well as market). Estimate the value of the equity per share today. (2 points)

Page
Hit 1 <GO> for more income statement information (CH2).

DG49 Equity D E S

I N C O M E S T A T E M E N T (Mil of \$) Page 8 / 10

M K G U S MALLINCKRODT INC

| | 6/1994 | 6/1995 | 6/1996 | 6/1997 |
|------------------------|---------|---------|---------|---------|
| Net sales | 1940.10 | 2043.20 | 1754.40 | 1861.20 |
| Cost of goods sold | 1037.30 | 1102.80 | 956.80 | 1017.60 |
| Sell, gen & adm exp | 617.30 | 650.60 | 506.90 | 536.70 |
| Operating inc(loss) | 285.50 | 289.80 | 290.70 | 306.90 |
| Interest expense | 39.80 | 55.50 | 51.30 | 48.10 |
| For exchange L (G) | 4.20 | -.70 | | .00 |
| Net non-op L (G) | 70.10 | -27.20 | -4.30 | -29.20 |
| Income tax expense | 64.00 | 98.30 | 90.00 | 102.30 |
| Reserve charges (cr) | .00 | .00 | .00 | .00 |
| Income bef XO items | 107.40 | 163.90 | 153.70 | 185.70 |
| XO L(G) pretax | 3.60 | -16.40 | -58.20 | -4.40 |
| Tax effect on XO items | | | | |
| Minority interest | .00 | .00 | .00 | .00 |
| Net income (loss) | 103.80 | 180.30 | 211.90 | 190.10 |
| | | | | |
| Tot cash pref. dvd | .40 | .40 | .40 | .40 |
| Tot cash comm. dvd | 37.30 | 41.80 | 45.70 | 48.20 |
| Avg # shares for EPS | 77.61 | 77.46 | 76.34 | 75.06 |
| EPS before XO items | 1.38 | 2.11 | 2.01 | 2.47 |
| EPS aft XO items | 1.33 | 2.32 | 2.77 | 2.53 |

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Page
Hit 1 <GO> for more balance sheet information (CH3).

DG49 Equity D E S

B A L A N C E S H E E T (Mil of \$) Page 9 / 10

M K G U S MALLINCKRODT INC

| | 6/1996 | 6/1997 | | 6/1996 | 6/1997 |
|--------------------|---------|---------|--------------------|---------|---------|
| Cash & near cash | 496.10 | 808.50 | Accounts payable | 147.00 | 169.30 |
| Marketable sec | .00 | .00 | ST borrowings | 109.40 | 11.70 |
| Acct & notes rec | 336.80 | 356.00 | Other ST liab | 637.00 | 472.70 |
| Inventories | 341.60 | 315.90 | Cur liabilities | 893.40 | 653.70 |
| Other cur assets | 78.00 | 136.40 | | | |
| Current assets | 1252.50 | 1616.80 | LT borrowings | 558.00 | 545.20 |
| | | | Other LT liab | 387.50 | 537.60 |
| LT inv't & LT rec | 2.50 | 4.20 | Noncur liabilities | 945.50 | 1082.80 |
| | | | Total liabilities | 1838.90 | 1736.50 |
| Depr fixed assets | 1148.50 | 1213.10 | | | |
| Non-depr fixed ass | 116.90 | 117.00 | Preferred equity | 11.00 | 11.00 |
| Accum depreciation | 434.50 | 502.20 | Minority interest | .00 | .00 |
| Net fixed assets | 830.90 | 827.90 | Share cap & APIC | 370.60 | 393.00 |
| | | | Retained earnings | 850.60 | 847.20 |
| Other assets | 985.20 | 538.80 | Shareholder equity | 1232.20 | 1251.20 |
| Total assets | 3071.10 | 2987.70 | Tot liab & equity | 3071.10 | 2987.70 |
| | | | | | |
| Shares out | 74.18 | 72.37 | ST part of LT debt | .00 | .00 |
| | | | # treasury shares | 12.84 | |
| | | | Amt treasury stock | 284.80 | 395.50 |

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Page
Hit 1 <GO> for more cash flow information (CH6).

DG49 Equity D E S

CASH FLOW SUMMARY (Mil of \$) Page 10/10

M K G U S MALLINCKRODT INC

| | 6/1994 | 6/1995 | 6/1996 | 6/1997 |
|------------------------|---------|---------|---------|---------|
| Net income (loss) | 103.80 | 180.30 | 211.90 | 190.10 |
| Deprec & amort | 104.60 | 125.00 | 149.10 | 127.70 |
| Other non-cash adj | 74.10 | 54.80 | -38.70 | -47.50 |
| Chg in non-cash wc | -55.20 | -76.40 | -151.90 | 33.70 |
| Cashflow-operating act | 227.30 | 283.70 | 170.40 | 304.00 |
| Disp of fixed asst | 8.60 | 21.20 | 120.50 | 412.80 |
| Capital expenditures | -172.30 | -160.80 | -169.20 | -169.50 |
| Sale LT invest | .00 | .00 | .00 | .00 |
| Purchase LT invest | .00 | .00 | .00 | .00 |
| Other investing acts | -36.40 | -134.30 | -148.80 | -23.50 |
| Cashflow-investing act | -200.10 | -273.90 | -197.50 | 279.80 |
| Dividends paid | -37.70 | -42.20 | -45.70 | -48.20 |
| Inc(dec) ST borrow | -58.60 | 19.90 | 511.70 | -103.80 |
| Increase: LT borrow | 196.40 | 3.20 | 199.50 | 1.10 |
| Decrease: LT borrow | -101.60 | -10.30 | -103.70 | -10.20 |
| Inc capital stock | 10.90 | 8.00 | 31.00 | 39.60 |
| Dec capital stock | .00 | -15.40 | -130.50 | -149.90 |
| Other financing acts | .00 | .00 | .00 | .00 |
| Cashflow-financing act | 9.40 | -36.80 | 462.30 | -271.40 |
| Net changes in cash | 36.60 | -27.00 | 435.20 | 312.40 |

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Interest Coverage Ratios, Ratings and Default Spreads

| <i>If interest coverage ratio is</i> | | | |
|--------------------------------------|-------------|------------------|------------------|
| <i>></i> | <i>≤ to</i> | <i>Rating is</i> | <i>Spread is</i> |
| -100000 | 0.199999 | D | 10.00% |
| 0.2 | 0.649999 | C | 7.50% |
| 0.65 | 0.799999 | CC | 6.00% |
| 0.8 | 1.249999 | CCC | 5.00% |
| 1.25 | 1.499999 | B- | 4.25% |
| 1.5 | 1.749999 | B | 3.25% |
| 1.75 | 1.999999 | B+ | 2.50% |
| 2 | 2.499999 | BB | 2.00% |
| 2.5 | 2.999999 | BBB | 1.50% |
| 3 | 4.249999 | A- | 1.25% |
| 4.25 | 5.499999 | A | 1.00% |
| 5.5 | 6.499999 | A+ | 0.80% |
| 6.5 | 8.499999 | AA | 0.50% |
| 8.50 | 100000 | AAA | 0.20% |

Industry Averages

| | Pharmaceuticals | Specialty Chemicals |
|-----------------------------------|-----------------|---------------------|
| Beta (Levered) | 1.15 | 0.70 |
| Debt/Equity Ratio (Market) | 10% | 35% |
| Return on Equity | 18% | 14% |
| After-tax Return on Capital | 15% | 12.5% |
| Capital Expenditures/Depreciation | 110% | 110% |

The marginal tax rate for all firms is 40%.

Corporate Finance: Final Exam - Spring 1999

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. The following is the beta calculation for PepsiCo, using monthly return data from the last 5 years:

$$\text{Return}_{\text{PepsiCo}} = 0.23\% + 1.20 (\text{Return}_{\text{S\&P 500}})$$

You are given the following additional information:

- The current market value of equity at Pepsi is \$ 40 billion and the firm has \$ 10 billion in debt outstanding.
- During the last 5 years, Pepsi had an average market value debt to equity ratio of 10%. The firm's marginal tax rate is 40%.

a. Using the raw beta estimate from the regression above, and the information provided, estimate Pepsi's current beta. (2 points)

b. Now assume that Pepsi will be spinning off its bottling operations for \$ 10 billion, borrowing an additional \$ 2 billion and buying back \$ 12 billion worth of stock. Estimate Pepsi's new beta. (The unlevered beta of firms involved in just bottling operations is 1.35) (3 points)

2. You have been asked to analyze a project, which is expected to have a net income of \$ 15 million on revenues of \$ 200 million next year; the depreciation is expected to be \$ 5 million next year. The project is expected to last forever, with no growth in revenues and earnings. The beta for the firm analyzing the project is 1.00, but this project is riskier than the rest of the firm and is expected to have a beta of 1.25. The initial investment needed for the project is \$ 150 million, and the firm is expected to borrow 40% of this investment, at a pre-tax cost of 8%. The capital maintenance expenditure, each year, is expected to be equal to depreciation. There are no working capital needs. Estimate the net present value of this project. (The treasury bond rate is 5%, and the market risk premium is 6.3%). (5 points)

3. Campbell Soup is planning a major restructuring. Its current debt to capital ratio is 10%, and its beta is 0.90. The firm currently has a AAA rating, and a pre-tax cost of debt of 6%. The optimal debt ratio for the firm is 40%, but the firm's pre-tax cost of

borrowing will increase to 7%. The market value of the equity in the firm is \$ 9 billion, and there are 300 million shares outstanding. (The treasury bond rate is 5%, the market risk premium is 6.3% and the firm's current tax rate is 40%)

a. Estimate the change in the stock price if the firm borrows money to buy stock to get to its optimal debt ratio, assuming that firm value will increase 5% a year forever and that investors are rational. (3 points)

b. Estimate the increase in stock price, if Campbell Soup were able to borrow money to get to its optimal and buy stock back at the current market price. (3 points)

c. As a final scenario, assume that Campbell Soup borrowed to get to 40%, but used the funds to finance an acquisition of Del Monte Foods. Assuming that they over pay by \$ 500 million for this acquisition, estimate the change in the stock price because of these actions. (You can assume rationality again, in this case) (1 point)

4. You have been provided with three years of historical data for Tandem computers, a firm that has paid dividends.

| | <i>1996</i> | <i>1997</i> | <i>1998</i> |
|--------------------------|-------------|-------------|-------------|
| Net Income | \$150 | \$225 | \$315 |
| | | | |
| Capital Expenditures | \$200 | \$250 | \$300 |
| Depreciation | \$125 | \$190 | \$250 |
| | | | |
| Non-Cash Working Capital | \$300 | \$330 | \$375 |

The firm started 1996 with a cash balance of \$ 100 million, and raised 10% of its external financing needs from debt; it will continue to finance future reinvestment needs with the same debt ratio. The non-cash working capital in 1995 was \$275 million. Each year the company pays out 20% of its net income as dividends.

a. Assuming that the firm did not buy back any stock over the period, estimate how much cash the firm would have at the end of 1998. (Assume that cash balances earn no interest) (3 points)

b. Assume now that the firm currently has 100 million shares outstanding, trading at \$ 40 per share, and would like to announce a stock buyback program for the next 2 years.

Assuming that net income will grow 25% a year for the next 2 years, and that capital expenditures and non-cash working capital will grow at the same rate, estimate (in dollar terms) how much stock the firm can buy back. (It wants to keep its cash balance from the end of 1998 intact and continue to pay 20% of its earnings as dividends) (3 points)

5. You have been asked to estimate the value of General Communications, a telecomm firm. General Communications has a debt to capital ratio of 30%, a beta of 1.10 and a pre-tax cost of debt of 7.5%. The firm had earnings before interest and taxes of \$ 600 million in 1998, after depreciation charges of \$ 300 million. The firm had capital expenditures of \$ 360 million, and non-cash working capital increased by \$ 50 million during 1998. The firm also had a book value of capital of \$ 2 billion at the beginning of 1998. (The treasury bond rate is 5%, the market risk premium is 6.3% and the firm has a tax rate of 40%). Assuming that the firm is in stable growth, and that the return on capital and reinvestment rates from 1998 can be sustained forever, estimate the value of the firm.

(3 points)

Spring 2000 : Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to assess the beta for AT&T after it acquires Media One. The following table summarizes the two firm's current values:

| | AT & T | Media One |
|--|----------------|---------------|
| Beta (based on regression over last 5 years) | 0.92 | 1.40 |
| Average D/E ratio over last 5 years | 12% | 25% |
| Current Market Value of Equity | \$ 240 billion | \$ 60 billion |
| Current Market Value of Debt | \$ 60 billion | \$ 40 billion |
| Tax Rate | 40% | 40% |

AT & T plans to borrow \$ 25 billion and use \$ 35 billion in new equity to buy Media One shares. It will assume Media One's existing debt. Estimate the beta for AT&T after the acquisition. (5 points)

2. As an alternative to buying Media One, AT&T had considering expanding into the media business and rejected the proposal because the net present value was -\$ 750 million. However, on reviewing the proposal, you notice that the analyst made three crucial errors:

- He ignored working capital in his analysis. You believe that working capital will be 10% of revenues. The revenues are expected to be \$ 2 billion a year for the next 5 years, and increase to \$ 3 billion a year after year 5.
- At the end of the 10th year, which was the last year of the project analysis, he assumed that the project would be terminated and estimated a salvage value (based upon the book value of \$ 2 billion for assets in year 10). You believe that the after-tax cash flow in year 10, which was \$ 225 million, would continue to grow 3% a year in

perpetuity. (You can assume that this cash flow already reflects the working capital investment needed in that year)

- Finally, he capitalized a portion of the initial investment relating to setting up a media division and depreciated this portion using straight line depreciation of \$ 200 million a year for 10 years to a salvage value of zero. In reality, AT&T would have expensed this item immediately (today).

If AT&T's tax rate is 40% and the cost of capital for this project is 9%, estimate the correct net present value for this project. (6 points)

3. Now assume that you are looking at AT&T's capital structure. The firm has 4 billion shares trading at \$ 60 per share, and debt, with a current market value of \$ 40 billion. The current levered beta for the firm is 0.99, and the current pre-tax cost of borrowing is 6.2%. The tax rate is 40%. You estimate AT&T's optimal capital structure to be 40%, and also estimate that the pre-tax cost of debt at that level will be 7.5%. [You can assume a 6% treasury bond rate, and a market risk premium of 4%]

a. Estimate the change in stock price if the firm moves to its optimal. (You can assume rational investors) (3 points)

b. How would your answer change if you were told that AT&T would be able to keep its existing debt on the books for their remaining life (10 years) at the existing coupon rate of 6.2%, while moving to its optimal debt ratio. (3 points)

4. You have been taking a look at AT&T's current cash balance. The firm has \$ 7 billion in cash on its balance sheet at the end of 1998, an increase of \$ 1.5 billion over the balance at the end of 1997. The firm paid out 20% of its 1998 earnings as dividends, bought back \$ 1 billion of stock and reported capital expenditures of \$ 3 billion and depreciation of \$ 2 billion during 1998; the non-cash working capital at the firm decreased by \$ 0.5 billion during the year. In addition, AT&T's total debt increased from \$ 40.3 billion at the start of the year to \$ 39.5 billion at the end. Estimate AT&T's net income for 1998. (6 points)

5. You have been asked to value an entertainment company for a possible acquisition by AT&T. The firm's current pre-tax operating income is \$ 150 million, and it has a 33.33% tax rate. The following table summarizes the estimates you have made for the firm for the next 3 years:

| | 1 | 2 | 3 | Term. year (4) |
|---------------------------------|-----|-----|-----|----------------|
| Exp. Growth in Operating Income | 15% | 15% | 15% | 5% |
| ROC | 20% | 20% | 20% | 15% |
| Cost of Capital | 12% | 11% | 10% | 9% |

The firm will be in stable growth after year 3.

- a. Estimate the expected free cash flows to the firm every year for the next 3 years. (2 points)
- b. Estimate the terminal value of the firm, i.e., the value at the end of the third year (2 points)
- c. Estimate the value per share today, if the firm has \$ 800 million in debt outstanding and 100 million shares. (2 points)

Spring 2001: Final Exam
Corporate Finance : Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to estimate the cost of capital for Simtel Enterprises, a firm with operations in different businesses. You are given the breakdown of the three businesses that Simtel is in below:

| <i>Business</i> | <i>Estimated Value</i> | <i>Average Unlevered beta: Comparables</i> |
|------------------------|------------------------|--|
| Telecomm Services | \$ 2.0 billion | 1.00 |
| Computer Software | \$ 1.0 billion | 1.25 |
| Real Estate Management | \$ 1.0 billion | 0.60 |

Simtel has 100 million shares outstanding, trading at \$ 20 a shares; its remaining capital is in the form of corporate bonds with a BB rating, carrying a default spread of 4% over the riskfree rate. Simtel's marginal tax rate is 40%. The long term treasury bond rate is 6% and the market risk premium is 4%.

- a. Estimate the cost of capital for Simtel. (2 points)
- b. Now assume that Simtel sells its real estate services division at its estimated value and uses the funds to retire debt. This will cause its rating to rise to A and the default spread on its bonds to drop to 1.5%. Estimate the new cost of capital for Simtel.

(3 points)

2. You have been asked to assess the net present value of a project analysis done by analysts at Ludens Inc., a firm that operates in both retailing and apparel production. The project, which is in the apparel business, has a 10-year life with equal annual cash flows over the period and an initial investment of \$ 1 billion.

You notice two problems with the analysis:

- The analyst used a cost of capital of 10% (which is the company's cost of capital) in computing the net present value of \$ 100 million. The cost of capital for the apparel business is 12%.

- The analyst expensed the entire investment in year 0; you believe that this is not likely to get approval from the tax authorities, and that you would need to depreciate the investment straight line over 10 years to a salvage value of zero. The tax rate is 30%.

Estimate the correct net present value of the project. (6 points)

3. Certiz Enterprises is considered a major recapitalization. The firm currently has a market value of \$ 1billion, a debt to capital ratio of 10%, a beta of 0.90 and a pre-tax cost of borrowing of 7%. It is considering tripling its debt to capital ratio to 30% and it believes that doing so will increase its firm value by 15%. The firm has a tax rate of 40%, the riskfree rate is 6% and the market risk premium is 4%. What will the cost of debt have to be at the 30% debt to capital ratio for firm value to increase by 15%. (You can assume a 5% growth rate in savings in perpetuity) (6 points)

4. Needham Inc. is a steel company that reported \$ 100 million in net income in the the just-completed financial year. The firm has a payout ratio of 30% and the dividends in the most recent year were exactly were exactly equal to the free cash flows to equity. The firm was all equity financed.

- a. Assume that you expect Needham to maintain a growth rate of 10% a year in net income and reinvestment (net cap ex and change in working capital) for the next year and that you anticipate that the firm will fund 20% of its new investments (net cap ex and working capital) with debt. If you maintain the policy of paying out the entire free cash flow to equity as dividends, what payout ratio can the firm afford next year? (2 points)
- b. Needham currently has a cash balance of \$ 100 million. If Needham increases its payout ratio to 40% and buys back \$ 50 million in new stock next year, estimate how much its cash balance will be at the end of next year. (You can use the net income, reinvestment and debt numbers that you estimated in part a)

5. You have been asked to assess the valuation of Robotronics Inc., a firms that manufactures metal parts. The analyst has valued the firm as a stable growth firm, based

upon its expected after-tax operating income next year of \$ 100 million, cost of capital of 10% and expected growth rate of 5%. Her estimate of the value of equity is \$ 1.2 billion and the firm has debt outstanding of \$ 300 million.

- a. What is the return on capital being assumed by the analyst in perpetuity?
- b. Estimate the value of equity if you assume that Robotronics Inc. is in a perfectly competitive industry, earning its cost of capital (of 10%) on its investments.

Corporate Finance : Final Exam – Spring 2002

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to assess the cost of capital for Mylar Telecommunications, a firm that has recently gone through financial turmoil. The firm has 100 million shares outstanding, trading at \$ 10 per share, and about \$ 9 billion in debt (in market value terms). The company is in two businesses – telecommunications equipment and internet services. You have collected the following information on the businesses:

| Business | Estimated Value | Unlevered beta from comparables |
|--------------------|-----------------|---------------------------------|
| Telecomm Equipment | \$ 6 billion | 0.90 |
| Internet services | \$ 4 billion | 1.40 |

The average coupon rate on the debt is 10% but the firm has been downgraded to a CC rating, and CC rated bonds trade at a default spread of 12% over the treasury bond rate (which is currently 5%). The firm has been steadily losing money and has accumulated net operating losses of more than \$ 4 billion; the firm does not expect to pay taxes for the next 4 years. (The market risk premium is 4% and the marginal tax rate for all firms is 40%)

- a. Estimate the levered beta for Mylar for next year. (2 points)
- b. Estimate the cost of capital for Mylar for the next year. (1 point)
- c. Now assume that Mylar could sell half of its internet business for fair market value (\$2 billion) and use the cash to pay off debt. Estimate the new levered beta of the firm. (3 points)

2. Healthy Foods Inc is considering introducing a new line of dried flowers. The firm expects to be able to generate \$ 4 million in revenues from this new line, each year for the next 10 years, and have a pre-tax operating margin of 50% on these revenues. Customers who come to buy the flowers are expected to buy the firm's traditional offerings (fresh fruit and baked goods) and it is anticipated that the annual revenues on these goods will increase as a result of these extra purchases from \$ 14 million to \$ 17 million, each year for the next 10 years. The firm has a 60% pre-tax operating margin on its traditional products. While Healthy Foods does not anticipate hiring any additional employees for this new business, it will have to pay more overtime to existing employees and the additional cost is expected to be \$ 1 million. Assuming a 10-year life, a 10% cost of capital, a 40% tax rate what is the maximum that you would be willing to invest in this new product line? (You can assume that

the initial investment will be depreciated straight line over 10 years to a salvage value of zero) (6 points)

3. You are trying to analyze the optimal debt ratio for Lamont Hotels, a firm that owns and operates a number of small hotels all over the country. The firm has 50 million shares trading at \$ 10 a share and \$ 125 million in debt outstanding.(in market value terms). The current (and correct) levered beta for the firm is 0.90 and the pre-tax cost of borrowing is 7%. The riskfree rate is 5% and the market risk premium is 4%. (Corporate tax rate = 40%)
- Estimate the current cost of capital for Lamont Hotels. (1 point)
 - The firm is planning to triple its dollar debt and use the proceeds to buy back stock. If it does so, it believes that its pre-tax cost of borrowing will rise to 8%. Estimate the new cost of capital for Lamont Hotels, if it does this. (3 points)
 - If you were told that investors in Lamont Hotels were rational and that the stock price increased by \$1.50 per share on the announcement of the buyback, estimate the expected growth rate in annual savings that the market must be assuming. (3 points)
4. You have collected two years of information on your company's earnings and dividends, as well as the cash balance at the end of each year.

| | <i>Most recent financial year</i> | <i>Previous year</i> |
|--------------------------|-----------------------------------|----------------------|
| Earnings | 110 | 100 |
| Dividends | 44 | 40 |
| Cash Balance at year-end | 100 | 78 |

The firm did not buy back any stock in either year.

- The firm is entirely equity financed, has no working capital needs and plans to stop paying dividends immediately because it views them as tax inefficient. It expects earnings from the most recent year to grow 10% a year for the next 3 years but net capital expenditures from the most recent year are expected to grow 20% a year for the next 3 years. If the firm plans a major stock buyback three years from now, estimate the cash balance it will have available for the stock buyback. (4 points)
- The firm based its conclusion that dividends were tax inefficient by examining its own stock price reaction to ex-dividend days over the last few years. On average, the stock price dropped 85 cents for every dollar paid in dividends. If the average capital gains tax rate over the period was 20%, estimate the tax rate paid on dividends (ordinary income) by investors in the company. (2 point)

5. Newhouse Publishing is a company that owns 2 newspapers and several weekly magazines. The firm is family-run and reported \$ 100 million in earnings before interest and taxes on revenues of \$ 1 billion in the most recent financial year; the book value of capital invested in the company at the start of that year was \$ 500 million. The capital expenditures during the year amounted to \$ 80 million, depreciation was \$ 50 million and non-cash working capital increased by \$ 20 million during the year. The firm's current cost of capital is 10%. (The tax rate is 40%)

a. If the firm continues to earn its current return on capital for the next 3 years and maintain the reinvestment rate it had last year, estimate the expected growth rate in after-tax operating income over these 3 years. (2 points)

b. Now assume that the return on capital will remain unchanged after year 3, but that the expected growth rate will drop to 4%. The cost of capital will drop to 9% after year 3. Estimate the terminal value of the firm. (2 points)

c. Estimate the value of the firm today. (2 points)

Corporate Finance : Final Exam – Spring 2003

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You are attempting to assess the cost of capital for Andersen Enterprises, a firm that manufactures window furnishings and also builds new houses; the window furnishings business accounted for 40% of the total revenues of \$ 1 billion in the most recent year. The firm is publicly traded and has 15 million shares outstanding, trading at \$ 40 a share and the market value of debt outstanding is \$ 400 million. The company is rated BBB, and the typical default spread for BBB rated bonds is 1.8% over the riskless rate. You have obtained the unlevered betas and average firm value/sales ratios for the two businesses that Andersen operates in below by looking at comparable firms:

| Business | Unlevered beta | Firm Value/Sales Ratio |
|-----------------------|----------------|------------------------|
| House furnishing | 1.30 | 1.6 |
| Construction services | 0.90 | 0.6 |

While Andersen has paid only 20% of its taxable income as taxes in the last three years, the marginal tax rate is 40%. The riskless rate is 5% and the market risk premium is 4%.

- a. Estimate the levered beta for Andersen. (2 points)
 - b. Estimate the cost of capital for Andersen. (1 point)
 - c. Now assume that Andersen is considering a plan to borrow \$ 200 million and expand its construction business. Assuming that this plan goes through, estimate the new levered beta for Andersen. (3 points)
2. The New York Times is considering introducing a new monthly magazine. The company anticipates that it will cost \$ 20 million in initial costs to create the infrastructure needed to produce the magazine, and that it can depreciate this cost straight line over the next 10 years to a salvage value of \$ 5 million. The Times expects to price the magazine at \$ 2 an issue on the newsstands and it expects advertising revenues of \$ 1.50 per issue sold; the printing and production costs are expected to be \$ 1 per issue. The magazine's contents will be produced by the existing staff of the paper, but the Times will have to increase its total annual payroll cost, which is currently \$ 20 million, by 10%. The cost of capital for the New York Times is 9% and it can be used for this investment as well. (The marginal tax rate is 40%.)

- a. If the New York Times expects to sell 200,000 copies a month each month for the next 10 years, estimate the annual after-tax cash flow from this investment. (2 points)
- b. Estimate the net present value of this investment, assuming that the project will end after 10 years. (1 point)
- c. How many papers will the Times have to sell each month to break even (in terms of NPV) on this investment? (3 points)
3. Nivea Inc. is a cosmetics firm that is examining its financing policy for possible changes. The firm has 10-year bonds outstanding with a face value of \$ 30 million and interest expenses of \$1.5 million a year; the firm has operating lease commitments of \$ 5 million a year for the next 5 years. The firm is rated BB and the default spread for BB rated bonds is 4%. There are 2 million shares trading at \$10 a share and the current levered beta for the firm is 2.80 (this was computed with the operating leases treated as part of the debt of the firm). The riskfree rate is 5% and the market risk premium is 4%. The corporate tax rate for the firm is 40%.
- a. Estimate the market value of outstanding debt (including operating leases) at the firm today. (2 points)
- b. Estimate the current cost of capital for the firm. (1 point)
- c. The firm believes it can lower its cost of capital to 8.25% if it moves to its optimal debt to capital ratio of 50%. If it is correct in this belief, estimate the pre-tax cost of debt for the firm at its optimal debt ratio. (2 points)
4. Livermore Technologies is a software firm that has never paid a dividend before but its boards of directors is considering whether to initiate dividends and if so, how much to pay. You have collected the following information on the firm:
- The most recent year's income statements is as follows:

| | |
|----------------------|---|
| Revenues | \$ 500 million |
| - Cost of goods sold | \$ 350 million (includes depreciation of \$ 40 million) |
| EBIT | \$ 150 million |
| - Interest expense | \$ 10 million |
| Taxable income | \$ 140 million |
| - Taxes | \$ 42 million |
| Net Income | \$ 98 million |

- The revenues, operating income and depreciation are expected to grow 10% a year for the next 3 years, but the tax rate for the company will increase to 40% of taxable income.
 - The non-cash working capital is currently 20% of revenues and this ratio is expected to not change over the next 3 years.
 - The firm reported capital expenditures of \$ 50 million last year, a level that will be maintained for the next 3 years.
 - The firm has an old bank loan of \$ 100 million (which is the firm's only debt) and it is expected to pay off the entire loan at the end of year 2. The firm does not plan any new borrowings for the next 3 years.
 - The firm is planning one major acquisition next year and it expects the acquisition to cost \$ 50 million. There are no other acquisitions planned for the next 3 years.
 - The current cash balance of the firm is \$ 80 million.
- a. Estimate the FCFE for the firm each year for the next 3 years. (5 points)
- b. Now assume that the firm wants to initiate dividend payments. Assuming that it wants to end up with a cash balance of \$ 50 million at the end of the third year, what percent of net income can the firm afford to pay out as dividends over the three-year period? (2 points)
5. UL Corporation is a small Midwestern manufacturing company. In the most recent financial year, the firm reported earnings before interest and taxes of \$ 100 million and it expects these earnings to grow 10% a year for the next 3 years and 3% thereafter; the corporate tax rate is 40%. The cost of capital is expected to be 12% for the next 3 years but it is expected to drop to 10% after year 3. The book value of capital at the beginning of the most recent year was \$ 400 million and UL Inc. expects to maintain its current return on capital in perpetuity.
- a. Estimate the free cashflows to the firm each year for the next 3 years. (3 points)
- b. Estimate the value of the firm at the end of year 3. (2 points)
- c. If the firm has a cash balance of \$ 100 million and the market value of debt is \$ 150 million, estimate the value of equity per share today. (There are 10 million shares outstanding) (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You are reviewing the beta calculation for Trumpeter Inc, a publicly traded company. The beta of 1.20 was obtained from a 5-year regression of stock returns against a market index and you believe that notwithstanding the unreliability of regression betas that this is a good estimate of the beta of the company over the period. During the entire five-year period, Trumpeter maintained a debt to equity ratio of 25% and was in two businesses – chemicals and steel. In the last week, though, the company has gone through a major restructuring, selling off its steel business and using some of the cash to buy back stock. The tax rate for the firm is 40%.
 - a. Estimate the unlevered beta for the company before the restructuring based upon the regression. (1 point)
 - b. Now assume that the steel business (which has been sold off) represented 30% of the total value of the firm and that the unlevered beta for steel companies is 0.80. One third of the cash from the divestiture was used to pay down debt and the other two thirds was used to pay a special dividend. Estimate the beta for Trumpeter after the restructuring. (5 points)
2. You have been asked to review an investment analysis of a 10-year project with a big upfront investment of \$ 10 million and equal annual after-tax cashflows for the next 10 years. The analyst has estimated a net present value for the project of \$ 1.5 million, using the cost of equity of the firm of 12% as the discount rate. You notice three errors in the valuation:
 - a. The cashflows being discounted are after taxes but before debt payments (interest and principal). The after-tax cost of debt for the firm is 4% and the firm has a debt to capital ratio of 30%.
 - b. The analyst has depreciated the initial investment of \$ 10 million straight line over 10 years to a salvage value of zero. You agree with the straight line depreciation but you believe that the asset should be depreciated down to an expected salvage value at the end of the 10th year of \$ 2 million.

- c. The project is expected to have revenues of \$ 15 million each year for the next 10 years and the non-cash working capital is expected to be 10% of the revenues over the entire period, with the investment in working capital being made at the beginning of each year. This investment will be fully salvaged in year 10.

The tax rate is 40%.

- a. Given the estimates of net present value and assumption of no salvage, what was the analyst's estimate of annual after-tax cash flow on the project? (2 points)
- b. What is the correct net present value for the project? (Make the necessary corrections to the cashflows and discount rates for the three errors noted on the last page) (4 points)
3. Salvatore Inc. is a motion picture production company. At the end of its most recent financial year, the firm had \$ 500 million in interest bearing debt on its books (with interest payments of \$ 35 million a year and an average maturity of 8 years). The firm has a rating of B+ and a pre-tax cost of debt of 8%. There are 50 million shares trading at \$ 6 per share and the levered beta for the firm is 2.25. The tax rate is 40%, the riskfree rate is 4% and the market risk premium is 4.82%.
- a. Estimate the current cost of capital for the firm. (2 points)
- b. Assume now that Salvatore Inc. is able to issue enough stock to retire half of its outstanding debt (in market value terms). If the stock price does not change after this transaction, estimate the pre-tax cost of debt after the transaction. (4 points)
4. You have been asked to compare the dividend policies of three firms in the same business and have collected the following information on them for the most recent year:

| | Halifax | Donnelly | Rutland |
|--------------------------------------|----------|----------|---------|
| Net Income | \$ 100 m | \$ 80 m | \$ 50 m |
| Capital Expenditures | \$ 150 m | \$ 60 m | \$ 30 m |
| Depreciation | \$ 60 m | \$ 30 m | \$ 15 m |
| Increase in Non-cash Working Capital | \$ 10 m | \$ 10 m | \$ 5 m |

| | | | |
|-----------------------|------|---------|---------|
| Debt to Capital Ratio | 0% | 20% | 20% |
| Dividends | \$ 0 | \$ 40 m | \$ 30 m |

- a. Assuming that these companies each started the most recent year with \$ 10 million in cash balances, estimate the cash balances at the end of the year.
(2 points)
- b. If Halifax had maintained the same debt ratio as the other two companies, how much could it have paid out in dividends in the most recent year without drawing on its starting cash balance?
(2 points)
- c. Assume that Rutland expects its net income to double next year while net capital expenditures will increase by 50% and non-cash working capital will increase by \$ 15 million. If the company wants to increase its cash balance by \$ 20 million next year and maintain its existing debt to capital ratio, how much can it afford to pay in dividends next year
(2 points)

5. You have been asked to value Supra Enterprises, a publicly traded firm and have collected the following information on the firm:

After-tax Operating income in most recent year = \$ 100 million

Net Income in most recent year = \$ 82.5 million

Book Value of Debt at the start of the year = \$ 250 million

Book Value of Equity at the start of the year = \$ 750 million

Capital Expenditure in most recent year = \$ 80 million

Depreciation in most recent year = \$ 30 million

Increase in non-cash Working capital in most recent year = \$ 10 million

- a. If you assume that Supra will maintain the return on capital and reinvestment rate that it had in the most recent year for the next 3 years, estimate the expected free cashflow to the firm each year for the next 3 years.

(2 points)

- b. After year 3, Supra expects the growth rate to decline to 3% and the return on capital to be 9% in perpetuity. If the cost of capital after year 3 is 8%, estimate the value at the end of the third year (terminal value). (2 points)
- c. Supra is expected to have a cost of capital of 10% for the next 3 years. If Supra has 100 million shares outstanding and \$ 400 million in debt, estimate the value of equity per share today. (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. DayTop Inns is a publicly traded company, with 10 million shares trading at \$ 70 a share and \$ 300 million in debt (market value as well as book value) outstanding. The firm derives 60% of its value from hotels and the remaining 40% from transportation. The unlevered beta is 0.8 for firms in the hotel business and 1.2 for firms in the transportations business. DayTop is rated A and can borrow money at 5%. The riskfree rate is 4.5% and the market risk premium is 4%; the corporate tax rate is 40%.

- a. Estimate the cost of capital for DayTop Inns. (2 points)
- b. DayTop Inns is considering acquiring SwissHotels, another hotel company (which derives 100% of its revenues from hotels) for \$ 400 million, three quarters of which it plans to fund by a new debt issue (which will cause its rating to drop and its cost of debt to rise to 5.5%) and a quarter by issuing new stock. Estimate the cost of capital after the acquisition. (4 points)

2. Spirit Software Inc. is a computer software company that generated \$ 12 million in pre-tax operating income on \$ 100 million in revenues last year; the firm is stable and does not expect revenues or operating income to change over the next 10 years. Its inventory management is in shambles and inventory as a percent of revenues amounted to 12% last year. Spirit is considering investing in a new inventory management system, which will cost \$ 15 million. The inventory management system is expected to have a 10-year life, over which period it can be depreciated straight line down to a salvage value of zero. The new inventory management system is expected to have two benefits:

- It will immediately reduce the inventory maintained of items that are least sold and lower the inventory/sales ratio to 8% (and stay at that percentage level for the life of the inventory management system)
- By providing salespeople with updated information on what is in stock, it is expected to increase revenues to \$ 115 million next year (and operating margins to remain unchanged). The revenues and operating income from year 2 to year 10 will remain unchanged at year 1 levels.

- The reduction in inventory will also allow the company to sell off its existing storage facility (which has a book value of \$ 5 million) today for \$ 10 million and buy a new storage facility for \$ 5 million. Both the old and the new storage facilities will be depreciated straight line over the next 10 years to a salvage value of zero.

The firm has an income tax rate of 40%, a capital gains tax rate of 20% and a cost of capital of 10%.

- a. Estimate the cashflows at time 0 (today) from this investment. (2 points)
- b. Estimate the NPV of investing in the new inventory management system.

(4 points)

3. PetSmart Inc.. is a publicly traded company involved in selling pet food and accessories. The firm has 15 million shares outstanding, trading at \$ 10 a share; it has \$ 50 million in 10-year bonds outstanding and interest expenses on the debt amounted to \$ 2 million. The firm currently is rated A with a cost of debt of 5% and has a levered beta of 1.56. The riskfree rate is 4.5% and the market risk premium is 4%. The corporate marginal tax rate is 40%.

- a. Estimate the current cost of capital for PetSmart. (2 points)
- b. PetSmart announces that it will be borrowing \$ 50 million and buying back stock at \$10.75 a share. This will lower the rating to BB, with a pre-tax cost of debt of 7%. Assuming that all of the existing debt gets refinanced at this new rate, estimate the value per share after this transaction. (You can assume a growth rate of 3% in perpetuity.)

4. Girardo Mowers Inc. is a company that manufactures lawn mowers. It had net income of \$ 15 million on revenues of \$ 50 million last year, after depreciation charges of \$ 10 million. Capital expenditures last year amounted to \$ 16 million and total non-cash working capital was \$ 10 million. The firm had a cash balance of \$ 15 million and paid 50% of its earnings as dividends last year. There is no debt outstanding.

- a. Assuming that revenues, capital expenditures and depreciation grow 10% a year and that net income grows 12% a year for the next four years, and that the non-cash working capital as a percent of revenues does not change over this period, estimate the cash balance at the end of year 4, if the company maintains its current payout ratio and borrows no money. (2 points)

b. What proportion of earnings will Girardo Mowers have to pay out as dividends if the firm wants to preserve its existing cash balance of \$ 15 million at the end of 4 years? (2 points)

c. Assuming that Girardo Mowers does not want to issue new stock and wants to maintain its existing payout ratio of 50% what debt ratio will the firm have to utilize over the next four years, to have a cash balance of \$ 30 million at the end of the fourth year. (2 points)

5. You are trying to value SafeMoney Inc., a commercial bank, using the dividend discount model. SafeMoney Inc. is expected to pay \$ 60 million in dividends on net income of \$ 100 million next year. It is in stable growth, expecting to grow 4% a year in perpetuity. The cost of equity for banks is 8%.

a. Value the equity in SafeMoney Inc. (1 point)

b. If the expected growth rate is correct, estimate the return on equity that you are assuming for SafeMoney Inc. in perpetuity. (2 points)

c. Assume now that you are told that SafeMoney can increase its return on equity to 12% in perpetuity, by lending to riskier clients. If the expected growth rate remains unchanged, what would the cost of equity have to be for the equity value to remain unchanged (from your answer in (a)? (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Vaudeville Inc. is a small entertainment firm. It has 20 million shares outstanding, trading at \$ 10 a share and \$ 50 million in outstanding debt. The firm's only business is making movies, but it does have \$25 million as a cash balance. The firm has a regression beta based upon two years of stock returns of 1.85. The unlevered beta, cleansed of and corrected for cash holdings, for firms in the movie business is 1.20. The corporate tax rate is 40%.

- a. Estimate the bottom-up beta for Vaudeville. (3 points)
- b. The firm is considering borrowing \$100 million and using the proceeds, in conjunction with the cash it has on hand, to enter the entertainment software business. The unlevered beta for firms in this business is 2.0. Estimate the beta for the company after the transaction. (3 points)

2. You are reviewing the net present value computation for a 5-year project, which requires an initial investment in fixtures and equipment of \$ 10 million. The analyst has assumed straight-line depreciation down to a salvage value of zero, no working capital or capital maintenance investments over time and constant revenues and earnings over the five years, and arrived at a net present value of -\$1.2 million (negative). The corporate tax rate is 40%.

- a. If the cost of capital used by the analyst is 10%, how much after-tax operating income is she assuming that the project will generate each year for the next 5 years. (2 points)
- b. Now assume that you find out that the project would be eligible for accelerated depreciation, with depreciation of \$ 4 million in year 1, \$ 3 million in year 2, \$1.5 million in year 3, \$ 1 million in year 4 and \$0.5 million in year 5. If the tax rate for the firm is 40%, estimate the effect on the net present value of moving to this schedule (from the straight line depreciation) (2 points)
- c. Assume that the firm that is considering this project earned \$ 40 million in pre-tax operating income last year; it had a book value of capital of \$ 400 million and a market value of \$ 1 billion. Assuming that the cost of capital of 10% applies to the entire firm, estimate the economic value added by this firm last year. (2 points)

3. Novacell Inc. is a manufacturer of solar panels that is considering moving from its existing policy of not borrowing money. The firm has 4 million shares outstanding, trading at \$ 25 a share, no cash holdings and a beta of 1.20. The riskfree rate is 5%, the equity risk premium is 4% and the corporate tax rate is 40%.

- a. Estimate the current cost of capital for the firm. (1 point)
- b. Assume that the firm can borrow \$ 25 million at a pre-tax rate of 7% and buy back shares.. Assuming that the firm is growing 3% a year in perpetuity and that investors are rational, estimate the change in value per share after the buyback. (2 points)
- c. Assume that instead of buying back shares, the firm had borrowed \$25 million and invested the money in expanding its existing business. If the expansion has a net present value of \$ 5 million, estimate the change in value per share after the transaction. (3 points)

4. You have been asked to assess the dividend policy of Doralee Inc, a service company that has been in existence only 3 years. The firm has provided you with its last three years of financial data:

| Year | 3 years ago | 2 years ago | Most recent year |
|--------------------------|----------------|----------------|------------------|
| Net Income | \$ 100 million | \$ 120 million | \$ 150 million |
| Capital Expenditures | \$ 80 million | \$ 110 million | \$ 125 million |
| Depreciation | \$ 50 million | \$ 60 million | \$ 70 million |
| Non-cash Working Capital | -\$10 million | \$ 10 million | \$ 20 million |
| Total Debt | \$ 0 | \$ 40 million | \$ 30 million |

(Note: You have been given total non-cash working capital each year, not the change)

You are also told that the firm had \$ 20 million in cash, no non-cash working capital and no debt when it started operations three years ago.

a. If the current cash balance is \$ 50 million, the firm bought back no stock and the firm maintained a constant dividend payout ratio over the 3 years, estimate the dividend payout ratio. (3 points)

b. Now assume that the firm expects net income, net capital expenditures and non-cash working capital to grow next year by 20%, while maintaining its dollar debt level and cash balance at last year's levels, estimate how much cash the firm will have available to return to stockholders next year. (3 points)

5. You are trying to value XGames Inc., a company that manufactures games for the XBos and Playstation. You have been provided the following information:

- The firm generated \$ 20 million in after-tax operating income in the most recent year and the corporate tax rate is 40%.
- The capital expenditures incurred in developing new games was \$ 15 million in the most recent year and depreciation was \$ 5 million.
- The non-cash working capital increased by \$ 5 million during the course of the year

a. Assuming that the after-tax operating income, capital expenditures, depreciation and non-cash working capital all are expected to grow 15% a year for the next 3 years, estimate the free cash flows to the firm each year for the three years. (2 points)

b. After year 3, you expect the growth rate to drop to 4% but you anticipate that the return on capital will stay stable at the same level that the firm maintained during the high growth period. If the cost of capital in stable growth is anticipated to be 10%, estimate the terminal value of the firm. (2 points)

c. If the firm has \$ 80 million in debt, \$ 25 million as a cash balance and 10 million shares outstanding, estimate the value per share today. (You can assume that the cost of capital is 12% for the first 3 years) (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to assess the cost of equity for Transverse International, a publicly traded firm that operates in the entertainment and travel businesses. You have collected the following information on the value generated by Transverse in each of the businesses and relevant sector information:

| <i>Business</i> | <i>Estimated Value</i> | <i>Averages for the Sector</i> | |
|-----------------|------------------------|--------------------------------|-----------------------|
| | | <i>Regression beta</i> | <i>Unlevered Beta</i> |
| Entertainment | \$ 1.5 billion | 1.50 | 1.20 |
| Travel | \$ 1 billion | 2.00 | 0.80 |

Transverse has a book value for equity of \$ 500 million and a book value of debt of \$ 500 million as well; the latter is also the market value for debt. The effective tax rate is 30% and the marginal tax rate is 40%.

- a. Estimate the unlevered beta for Transverse International. (1 point)
- b. Estimate the levered beta for Transverse International. (2 points)
- c. Assume that Transverse plans to borrow \$ 1 billion to use for two purposes: \$ 500 million will be used to buy back stock and \$ 500 million to expand the travel business. Estimate the levered beta after the transaction. (3 points)

2. Mathias Steel is a publicly traded steel company with an ageing steel plant. It currently generates \$ 1 million in annual pre-tax operating income on revenues of \$ 50 million from the plant; the annual depreciation charge is \$ 500,000. With no additional capital investments, the plant can be expected to continue to generate the same operating income and depreciation for the next 5 years and have no salvage value at the end of that period. Mathias Steel is considering scrapping the existing plant for today's book value and upgrading it by investing \$ 10 million today; the amount can be depreciated straight line over the next 10 years. The upgrade will increase the annual pre-tax operating income to \$ 2.5 million and extend the life of the plant to 10 years, with no salvage value at the end. The marginal tax rate is 40% and the cost of capital is 10%.

- a. Estimate the initial investment (year 0), net of salvage from the old plant., (1 point)
- b. Estimate the incremental annual after-tax cashflows for years 1-5. (2 points)
- c. Considering all relevant cash flows, estimate the NPV of upgrading the plant today. (3 points)

3. Damocles Inc., a publicly traded firm, has 80 million shares trading at \$ 10 a share and \$ 200 million in debt (market value and book value). The firm currently has a beta of 1.20 and a pre-tax cost of debt of 5%. The riskfree rate is 4% and the market risk premium is 4.5%. The marginal tax rate is 40%.

- Estimate the current cost of capital for the firm. (1 point)
- The firm has announced that it will be borrowing \$ 200 million and buying back shares. The rating for the firm will drop to BBB, causing the pre-tax cost of debt to rise to 6%. Estimate the new cost of capital for the firm. (2 points)
- Now assume that investors are rational and that the firm is growing 4% a year in perpetuity. How many shares can Damocles expect to buy back with \$ 200 million? (2 points)

4. Cumina Stores is an all-equity-funded retailer looking for some guidance on dividend policy. Over the last 3 years, the company has seen its revenues and net income increase and has maintained a dividend payout ratio of 40% of net income:

| Year | 3 years ago | 2 years ago | Most recent year |
|--------------|-------------|-------------|------------------|
| Revenues | \$1,000 | \$1,200 | \$1,500 |
| Net Income | \$ 100 | \$ 120 | \$ 150 |
| Depreciation | \$ 50 | \$ 60 | \$ 75 |

Over the same three year period, Cumina Stores has seen its cash balance decline from \$ 60 million to \$ 20 million.

- Based on the information provided, estimate how much the firm reinvested in long-term assets and working capital over the 3-year period. (2 points)
- Assume now that revenues, net income and depreciation are expected to grow 10% a year for the next two years. Working capital is expected to remain 25% of total revenues over the period and capital expenditures will be 200% of depreciation each year. If the firm wants to maintain its dividend payout ratio at 40% and increase its cash balance back to \$ 60 million, how much debt (as a percent of reinvestment) will the firm have to take on for this to be feasible? (4 points)

5. You are reviewing the discounted cash flow valuation of Roland Inc., a publicly traded automobile parts company. The analyst estimated the following numbers for the next 3 years (the high growth period) for the company:

| Year | Current | 1 | 2 | 3 |
|-----------|---------|---------|----------|----------|
| EBIT(1-t) | \$80.00 | \$92.00 | \$105.80 | \$121.67 |
| FCFF | \$20.00 | \$23.00 | \$26.45 | \$30.42 |

- Assuming that the firm will maintain its existing return on capital for the next 3 years and that the analyst estimates of free cash flow and earnings are correct, estimate the return on capital for the firm. (2 points)
- At the end of year 3, the firm will be in stable growth, with a cost of capital of 10% and an expected growth rate of 4% forever. If the return on capital after year 3 will be 12%, estimate the value of the firm at the end of year 3. (2 points)
- The firm currently has a cost of capital of 12% (higher than its stable period cost of capital), a cash balance of \$ 50 million and debt outstanding of \$ 250 million. If there are 100 million shares outstanding, estimate the value of equity per share today. (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to assess the impact of a proposed acquisition on the beta of a firm and have been provided the following information on the two firms involved in the deal:

| | Trident (Acquirer) | Achilles (Target) |
|------------------------------|-----------------------|----------------------|
| Number of shares outstanding | 1500 | 1000 |
| Share price | \$8.00 | \$6.00 |
| Market & Book value of debt | \$3000 | \$4000 |
| Book value of equity | \$8000 | \$8000 |
| Levered Beta | 1.2 | 1.5 |
| Tax rate | 40% | 40% |
| Rating | AAA | BBB |
| Default spread | 0.50% | 2.50% |

The riskfree rate is 4% and the equity risk premium is 6%.

- a. Estimate the unlevered beta of the combined firm. (3 points)
- b. Now assume that Trident plans to retire all of Achilles' debt and that it will be able to buy Achilles's equity at the current market price. If Trident would like to have a levered beta of 1.35 for the combined firm after the transaction, estimate how much new debt it will need to raise to finish this acquisition. (2 points)
- c. Finally, assume that the bond rating for the combined firm will drop to A+ after the transaction, with a default spread of 1.5%, estimate the cost of capital for the combined firm after the merger. (1 points)

2. You have been asked to examine the net present value computation for a 10-year project done by another analyst. The project will require an initial investment of \$ 600 million and will be depreciated straight line over 10 years to a salvage value of zero. The project is expected to generate constant after-tax operating earnings every year for the next 10 years. The analyst estimated a net present value of \$ 20 million for the project. To arrive at this value, he discounted the after-tax operating income (EBIT (1-t)) at the cost of equity and ignored working capital investments in his NPV computation. (In effect, the analyst discounted after-tax operating income at the cost of equity and subtracted out the initial investment in fixed assets to arrive at the NPV)

- You estimate that the project will require an initial investment in non-cash working capital of \$ 50 million, which can be fully salvaged back at the end of the 10th year.
 - The cost of equity is 12%, based upon the correct levered beta, but the firm has a debt to capital ratio of 40% and an after-tax cost of debt of 4%. (The tax rate is 40%)
- a. a. Estimate the "correct discount rate" that the analyst should have used to discount the cash flows. (1 point)

b. Assuming that the analyst's estimate of after-tax operating income is correct, and taking into consideration his mistakes in computing the NPV, estimate the annual after-tax operating income on this investment. (2 points)

c. Estimate the correct net present value on this investment, with all of the cash flows considered and using the correct discount rate. *[You will need part b to do part c. If you have trouble with part b, use \$ 100 million as your after-tax operating income and specify that you did so]* (2 points)

d. How would your answer to part c change if you were told that the initial investment could be depreciated over five years instead of ten. (The project will still last 10 years) [Hint: You do not have to do the whole analysis over. There is a short cut] (1 point)

3. You have been asked by Med Parts Inc, a medical device maker, for advice on whether they are using the right mix of debt and equity to fund their operations. The firm has 120 million shares trading at \$ 10 a share and \$ 300 million in outstanding debt. The current levered beta for the firm is 1.10 and the pre-tax cost of borrowing is 6%. The marginal tax rate is 40%, the riskfree rate is 5% and the equity risk premium is 4%.

a. Estimate the current cost of capital for the firm. (1 point)

b. If the market is valuing the firm correctly today and the expected free cash flow to the firm next year is \$ 80 million, estimate the implied growth rate in this cash flow in perpetuity (given the cost of capital that you estimated in part a). (2 points)

c. You estimate the optimal debt ratio for the firm to be 40% and believe that the cost of capital will drop to 8%, if you move to the optimal by borrowing money and buying back shares. If you buy back the shares at \$10.25/share, estimate the increase in value per share for the remaining shares. *[You will need part b to do part c. If you have trouble with part b, use 5% as your growth rate forever and specify that you did so]* (2 points)

d. Med Parts is considering whether it should be reinvesting the funds from new debt back into the business, rather than buying back stock. Under which of the following circumstances does it make sense for Med Parts to make this switch? (1 point)

i. Never. Buying back stock will always increase the stock price more than taking new investments.

ii. Only if the new investments generate returns that exceed the after-tax cost of debt.

iii. Only if the new investments generate returns that exceed the cost of capital at the existing debt ratio.

iv. Only if the new investments generate returns that exceed the cost of capital at the new debt ratio.

v. Always, because the new investments will increase future growth.

4. You are trying to get a sense of how much Woods Inc, a sports supplies firm, should pay in dividends looking forward. You do know the following facts about the firm:

- The firm generated \$ 25 million in net income on revenues of \$ 100 million in the most recent year and reported depreciation of \$ 10 million for the same time period.
- Capital expenditures in the most recent time period amounted to \$ 15 million and total non-cash working capital currently is \$ 12 million.

- The firm expects revenues, net income, depreciation and capital expenditures to grow 20% a year for the next 3 years and non-cash working capital to be maintained at its current proportion of revenue.
- The firm has a cash balance right now of \$ 20 million. (You can assume that cash does not earn interest income)
- The firm has a debt to capital ratio of 25% currently.
 - a. If the firm would like to increase its cash balance to \$ 30 million by the end of the third year, estimate the payout ratio that the firm will have to maintain for the next 3 years, assuming that the firm maintains its existing debt ratio.. (3 points)
 - b. Now assume that the firm is considering an alternative strategy. It will like to repay \$ 10 million in debt each year for the next 3 years. Estimate the payout ratio that the firm will have to maintain, on average over the next 3 years, if it wants its cash balance to remain unchanged at its current level of \$ 20 million. (2 points)
 - c. Stock buybacks have increased in popularity over the last decade in the United States. Which of the following is the most likely explanation for the phenomenon?
 - i. Pension funds, which are tax exempt, hold a larger proportion of equity than they used to.
 - ii. Dividends are taxed at higher rates than capital gains.
 - iii. Firms are less certain about future earnings and cash flows.
 - iv. Buybacks reduce the number of shares outstanding
 - v. None of the above

5. Past Perfect Inc. is a small firm that sells antique furnishings. In the most recent year, the firm generated \$ 4 million in after-tax operating income on revenues of \$ 40 million; the firm reported book value of equity of \$ 8 million and book value of debt of \$ 4 million at the beginning of the year. During the year, the firm invested \$ 2 million in a new warehouse for furniture (its only cap ex) and reported depreciation of \$ 1 million in its income statement. The firm's only working capital item is its inventory, which increased by \$ 200,000 during the course of the year. The cost of capital for the firm is expected to be 12% for the next 3 years and 10% thereafter. You have been asked to appraise the value of the company

- a. Assuming that the firm maintains its existing return on capital and reinvestment rate for the next 3 years, estimate the expected free cash flow to the firm each year for the next 3 years. (2 points)
- b. Estimate the value of the firm at the end of year 3, assuming that the return on capital stays at the current level but the growth rate drops to 3%. (2 points)
- c. Assuming that Past Perfect Inc has 5 million shares outstanding, estimate the value of equity per share. (You can assume that the book value of debt = market value of debt, and that the debt remained unchanged over the most recent year. You can also assume no cash) (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to evaluate the quality of investments at Gardena Inc., a firm that operates in two businesses – cement and steel. You have been provided the following information on the businesses:

| | <i>Book Value</i> | <i>Market Value</i> | <i>Unlevered beta of business</i> |
|--------|-------------------|---------------------|-----------------------------------|
| Cement | \$500 | \$900 | 0.90 |
| Steel | \$500 | \$600 | 1.20 |
| Total | \$1,000 | \$1,500 | |

The firm has 100 million shares, trading at \$10 a share and faces a marginal tax rate of 40%. The company’s bonds have an A rating and a default spread of 2%. The riskfree rate is 4% and the equity risk premium is 5%.

- a. Estimate the cost of capital for the company. (2 points)
 - b. Gardena generated \$ 100 million in after-tax operating income in the most recent year, with \$75 million coming from the cement business and the rest from steel. Assuming that the book values of assets did not change over the last year, estimate the economic value added (EVA) of each business separately. (You can assume that both businesses share the same debt ratio) (4 points)
2. Life Products Inc. is a small pharmaceutical company that has developed a drug that treats immune disorders. The drug has been approved for use and has 15 years left of its patent life. The company is considering two mutually exclusive options:
- a. Invest \$750 million in capital, depreciable straight line over 15 years to a salvage value of zero, and produce the drug itself. The drug is expected to generate \$ 90 million in after-tax operating income each year for the 15 years.
 - b. License the drug to Pfizer and receive a fixed licensing fee each year from Pfizer. There will be no initial investment and the only risk that Life Products faces is that Pfizer may default.

You are provided with the costs of debt, equity and capital for both Life Products and Pfizer in the table below:

| | Pre-tax cost of debt | After-tax cost of debt | Cost of equity | Cost of capital |
|---------------|----------------------|------------------------|----------------|-----------------|
| Life Products | 8.00% | 4.80% | 14.00% | 12.50% |
| Pfizer | 5.00% | 3.00% | 9.00% | 7.50% |

- a. Assuming that Life Products invests \$750 million in capital and produces the drug itself, what NPV would you estimate for the investment? (3 points)

- b. What annual licensing fee would Pfizer have to offer Life Products for the licensing deal to create more value for Life Products than Health Products producing the drug itself? (3 points)
3. CIQ Inc. is a company that provides information services to financial service companies. The company currently has 150 million shares, trading at \$ 10 a share, and \$ 500 million in debt (book and market). The firm currently has a beta (levered) of 1.20 and a pre-tax cost of debt of 6%; the marginal tax rate is 40%; the risk free rate is 4% and the equity risk premium is 5%. The firm is considering borrowing \$ 500 million and buying back stock; it believes that doing so will lower its cost of capital to 8%. (You can assume no growth in the savings in perpetuity)
- a. Assuming that the firm can buy back stock at \$10.25/share, estimate the increase in value per share for the remaining shares. (3 points)
- b. Now assume that you do not know what the price per share will be on the stock buyback. How much would the price per share on the buyback have to be for the value per share on the remaining shares to remain unchanged at \$10/share? (3 points)
4. You are reviewing the earnings and cash flows statements of Texeira Ltd, a sports goods manufacturer that is all equity funded and have uncovered the following information on the firm over the last 3 years.

| | Year -3 | Year -2 | Last year |
|--------------------------|---------|---------|-----------|
| Revenues | \$1,000 | \$1,200 | \$1,500 |
| Net Income | \$100 | \$120 | \$150 |
| Depreciation | \$25 | \$40 | \$50 |
| Non-cash Working capital | \$100 | \$90 | \$75 |

Texeira had a cash balance of \$ 100 million two years ago (at the end of year -3) and has seen that cash balance increase to \$ 120 million today. (You can assume that year -1 has just ended...)

- a. Assuming that the firm bought back no equity over the last two years and paid out 40% of its earnings as dividends, estimate how much the firm spent on capital expenditures (cumulated) over the last two years (i.e., years -1 and -2). (2 points)

b. You are now looking at making a forecast for next year and believe that the following assumptions hold:

- i. Revenues, net income and depreciation are expected to grow 15% next year.
- ii. Non-cash working capital as a percent of revenues will remain unchanged next year
- iii. Capital expenditures are expected to be 50% higher than depreciation next year
- iv. The company will finance 25% of its reinvestment needs (net cap ex and change in working capital) with debt.

If the company wants to maintain its current payout ratio and reduce its cash balance from \$120 million to \$ 100 million, how much stock can it buy back next year? (3 points)

5. You are trying to value Hypo Bank, a European bank that has gone through a tumultuous adjustment to the crisis of 2008. The bank suspended dividends last year and currently has a book value of equity of \$ 400 million and generated net income of \$ 100 million on loans of \$ 5 billion in the most recent year. The bank expects both loans and net income will grow at 10% a year for the next 5 years. The cost of equity is expected to be 12% for the next 5 years and 10% thereafter.

a. Assuming that the bank would like to increase its regulatory capital ratio (defined as book equity/ loans) to 9% in year 5 in equal annual increments from the current level over the next 5 years, estimate the FCFE each year for the next 5 years. (3 points)

b. At the end of year 5, the bank expects to be in stable growth and grow at 4% a year in perpetuity. It also expects to generate a return on equity of 12% in perpetuity. Estimate the terminal value of equity (at the end of year 5) for the bank. (2 points)

c. If the bank has 50 million shares outstanding currently, estimate the value per share today. (1 point)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Clarix Inc. is a publicly traded company that operates in two businesses – it generates 60% of its value from entertainment and 40% from electronics. The company has 100 million shares trading at \$ 8/share, has \$ 400 million (market and book value) in interest bearing debt and lease commitments of \$ 80 million each year for the next 6 years. The current levered beta for the firm is 1.15 and the current bond rating for the firm is BBB, which corresponds to a default spread of 1.5%. The ten-year US treasury bond rate is 3.5%, the equity risk premium is 5% and the marginal tax rate is 40%.
 - a. Estimate the current cost of capital for the firm. (2 points)
 - b. Now assume that the firm plans to sell its electronics business at fair value and use 75% the proceeds to pay a special dividend to equity investors and 25% of the proceeds to retire interest bearing debt. If the unlevered beta of the electronics business is 0.90 and this transaction will lower the rating to BB (with a default spread of 3%), estimate the cost of capital after the transaction. (4 points)

2. Fatburger Inc. is a company that operates fast food restaurants and it is considering producing packaged food for sale at grocery stores. The initial investment in production facilities to start this venture will be \$ 60 million, depreciable straight line over 10 years to a salvage value of \$10 million. The packaged food business is expected to generate revenues of \$ 100 million each year for the next 10 years and the EBITDA margin (EBITDA/revenues) is expected be 15% on these revenues. The working capital is expected to be 10% of revenues, with the investment occurring at the start of each period, where needed. The cost of capital for Fatburger is 12% but the cost of capital for other firms in the packaged food business is 9%. The marginal tax rate is 40%.
 - a. Estimate the NPV of the investment. (3 points)
 - b. Now assume that you expect this business to continue in perpetuity, after year 10. Estimate the NPV of the investment today. (2 points)
 - c. Now assume that the packaged food business will increase the after-tax cashflows at the fast food restaurants by \$ 5 million a year for the next 10 years. What value would you attach to this synergy? (1 point)

3. Prolox Inc. is a pharmaceutical company with 100 million shares trading at \$10/share and debt outstanding of \$ 250 million. The firm has a levered beta of 1.00 and a pre-tax cost of debt of 4.5%. The riskfree rate is 3.5%, the marginal tax rate is 40% and the equity risk premium is 5%.
 - a. Estimate the current cost of capital for the firm. (1 point)

b. Now assume that the firm plans to borrow \$ 500 million and buy back stock. If this will triple the default spread on the debt (both new and existing), estimate the new cost of capital for the firm after the recapitalization. (2 points)

c. Now assume that the firm does buy back stock with the \$ 500 million and pays \$ 11/share. Estimate the value per share for the remaining shareholders in the company. (You can assume no growth in perpetuity) (2 points)

d. How would your answer to c have changed, if the firm had been able to keep all of its existing debt at the existing interest rate of 4.5% even after the recapitalization?

i. The value per share after the buyback will be higher than estimated in part c

ii. The value per share after the buyback will be lower than estimated in part c

iii. The value per share after the buyback will not change from the value estimated in part c.

4. You have been asked to review the dividend policy of Calpower Inc., a small all-equity funded energy company. In the most recent year, the company had revenues of \$ 60 million, net income of \$ 10 million and paid out \$ 2 million in dividends. During the most recent year, the company also had \$ 8 million in capital expenditures and depreciation of \$ 5 million. Over the course of the year, its non-cash working capital decreased from \$ 7 million at the start of the year to \$ 6 million at the end and the total debt outstanding increased by \$ 1 million.

a. If Calpower Inc. started the most recent year with \$ 3 million as a cash balance, what was the cash balance at the end of the year. (2 points)

b. Calpower expects its revenues, net income and depreciation to increase by 50% next year. During the next year, it also expects capital expenditures to be \$ 10 million and to maintain its working capital at the same percent of revenues it had at the end of the most recent year. If the firm plans to raise the same proportion of its reinvestment needs¹ from debt as it did in the most recent year, what payout ratio can the firm have next year, if it wants to increase its cash balance by \$ 2 million? (3 points)

c. Now assume that you are a stockholder in Calpower and are examining whether to put pressure on the company to return even more cash to its stockholders.

Which of the following circumstances relating to the company would make you more likely to pressure the company to return cash to stockholders?

(1 point)

¹ Reinvestment needs = Capital expenditures – Depreciation + Change in non-cash working capital

- i. Positive Jensen's alpha, negative EVA
- ii. Positive Jensen's alpha, positive EVA
- iii. Negative Jensen's alpha, negative EVA
- iv. Negative Jensen's alpha, positive EVA

5. Singular Steel is a small, steel company. In the most recent year, the firm reported \$ 20 million in after-tax operating income on revenues of \$ 200 million. The firm has 20 million shares trading at \$10/share and a book value of equity of \$ 50 million; it has \$ 50 million in debt outstanding (book and market) and a cash balance of \$ 20 million. The firm's current cost of capital is 12%.

- a. Assume that the firm can maintain its existing return on capital for the next 5 years and expects after-tax operating income to grow 10% a year. Estimate the expected free cash flows to the firm for the next 5 years. (2 points)
- b. At the end of year 5, the firm is expected to be in stable growth and grow at 3% a year in perpetuity. In stable growth, the cost of capital for the firm is expected to drop to 10% and the return on capital will also decline to 15%. Estimate the value at the end of year 5 (the terminal value). (2 points)
- c. Estimate the value per share today. (2 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Novellus Inc. is a publicly traded company that operates in three businesses with the following characteristics:

| | Revenues (in millions) | Estimated Enterprise Value (in millions) | Unlevered Beta |
|----------------|------------------------|--|----------------|
| Storage Device | \$600.00 | \$400.00 | 0.9 |
| Electronics | \$500.00 | \$600.00 | 1.2 |
| Social Media | \$400.00 | \$800.00 | 1.8 |

The firm has 100 million shares trading at \$ 12/share, has no cash balance and raises the rest of its funding from debt. The marginal tax rate is 40%.

- a. Estimate the current levered beta for the firm. (2 points)
 - b. Assume that Novellus is planning to sell its storage device business for the estimated value and invest half the proceeds in its social media business and use the other half to retire debt. Estimate the new beta for the firm. (2 points)
 - c. How would you answer to (b) change, if you used the proceeds entirely to buy back shares in the company? (2 points)
2. You own a retail business and generated \$ 40 million in EBITDA on revenues of \$ 200 million in the most recent year. You are considering spending \$ 20 million in a new computerized inventory system; the investment is depreciable straight line over 5 years to a salvage value of zero. If you install the system, you expect to see **two primary benefits**:
- Your revenues which had been expected to be flat (\$200 million each year) for the next 5 years will grow 5% each year for the next 5 years with the new system in place (\$210 million next year, \$ \$220.5 million in year 2 etc...)
 - Your EBITDA margin (as a percent of revenues) will remain unchanged at current levels for the next 5 years but you do expect your non-cash working capital which is currently 10% of revenues to drop to 5% of revenues immediately and remain at that percent level each year for the next 5 years.

At the end of year 5, you expect to scrap the new inventory system and get no salvage value for the system. The working capital is expected to revert back to 10% of revenues at the point in time. Your marginal tax rate is 40% and your cost of capital is 10%.

- a. Estimate the NPV of the investment. (3 points)
- b. If you can expense the computerized inventory system rather than depreciate it, estimate the NPV of the investment. (1 point)
- c. Now assume that you are offered the alternative of using a service to manage your inventory. Assuming that the benefits that the service delivers are equivalent to those stated in part (a), i.e., higher growth in revenues and lower working capital requirements, how much would you be willing to pay as an annual fee for this service for the next 5 years? (2 points)

3. You are looking at Lizma Steel, a mature steel company that generated \$ 120 million in operating income (EBIT) last year on revenues of \$ 5 billion. The firm has 40 million shares trading at \$ 20/share and \$ 200 million (book & market) in debt. The current beta (levered) is 1.15 and the pre-tax cost of debt is 4%. The marginal tax rate is 40%, the riskfree rate is 3% and the equity risk premium is 6%.
- Estimate the current cost of capital for Lizma Steel. (1 point)
 - Now assume that you are considering doing an LBO (leveraged buyout) of Lizma Steel and are looking to move to a mix of 90% debt and 10% equity. If the pre-tax cost of the debt in the LBO will be 7.5%, estimate the cost of capital at a 90% debt ratio. (2 points)
 - How much would you need to borrow (in dollar terms) to get to a 90% debt ratio of the new firm value? (If necessary, you can assume that any savings you get from a change in cost of capital will be perpetual and have no growth) (2 points)
 - How (if at all) would your answer to part (b) change if you were told that Lizma Steel has only \$ 60 million in operating income? (1 point)
4. You have been provided with forecasts of operating items for Zune Inc. for the next 5 years (in millions):

| | Most recent year (just ended) | 1 | 2 | 3 | 4 | 5 |
|--------------------------|-------------------------------|---------|---------|---------|---------|---------|
| Revenues | \$1,000 | \$1,100 | \$1,200 | \$1,300 | \$1,400 | \$1,500 |
| EBITDA | \$250 | \$275 | \$300 | \$325 | \$350 | \$375 |
| Depreciation | \$60 | \$66 | \$72 | \$78 | \$84 | \$90 |
| Net Income | \$80 | \$88 | \$96 | \$104 | \$112 | \$120 |
| Non-cash Working Capital | \$75 | \$70 | \$65 | \$60 | \$50 | \$40 |
| Total Debt outstanding | 150 | 145 | 140 | 135 | 130 | 125 |

- The firm currently has a cash balance of \$ 150 million and expects this cash balance to drop to \$50 million by the end of year 5. If the company plans to pay out 60% of its earnings as dividends for the next 5 years, how much capital expenditure does it have planned cumulatively for the five-year period? (3 years)
- If the company would like to keep its cash balance unchanged over the next 5 years, i.e., it wants its cash balance to be \$ 150 million at the end of year 5, and pay off all of its debt over the 5 years, what dividend payout ratio should the firm maintain, on average, over the next 5 years? (2 points)
- Which of the following would you consider the most defensible reason for a company that has never paid dividends before, to initiate dividends? (1 point)
 - The company wants to attract pension fund investors who are restricted from buying stocks that don't pay dividends
 - The company had a windfall gain from a lawsuit that increases income and cash flows this year.
 - The company expects earnings growth and reinvestment needs to be much higher in the future
 - The company expects its earnings growth and reinvestment needs to decrease in the future

- v. All the other companies in the sector pay dividends
5. You are trying to value Kappa Inc., a small, publicly traded entertainment company. The firm generated \$ 10 million in after-tax operating income in the most recent year on revenues of \$ 80 million; the invested capital (book value) at the start of the year was \$ 100 million. The firm is expected to maintain its existing return on capital in perpetuity. Capital expenditures in the most recent year amounted to \$ 12 million, depreciation was \$ 5 million and non-cash working capital increased from \$ 6 million to \$ 8 million during the course of the year. The firm is expected to have a 12% cost of capital for the next 5 years and 8% thereafter.
- a. Assuming that Kappa maintains the reinvestment rate that it posted in its most recent year for the next 5 years, estimate the expected free cash flows to the firm each year for the next 5 years. (3 points)
- b. At the end of year 5, Kappa Inc. is expected to be a stable growth firm, growing 3% a year in perpetuity. Estimate the terminal value (the value at the end of year 5). (2 points)
- c. Finally, assume that Kappa Inc. has a cash balance of \$ 15 million, debt outstanding (in book and market terms) of 40 million and 8 million shares outstanding, estimate the value per share. (1 point)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam. For partial credit, when discounting, please show the discount rate that you are using (not just the PV).

1. Clarus Corp is a company that operates in two businesses, steel and technology, and in two countries, the US and Brazil. The table below summarizes the revenues by business and by country (in millions):

| | US | Brazil | Total |
|------------|------------|----------|------------|
| Steel | \$800.00 | \$400.00 | \$1,200.00 |
| Technology | \$600.00 | \$300.00 | \$900.00 |
| Total | \$1,400.00 | \$700.00 | |

You have estimated unlevered betas of 0.90 for steel and 1.20 for technology and equity risk premiums of 6% for the US and 9% for Brazil. The US Treasury bond rate is 3% and the Brazilian \$ denominated bond rate is 5%. Clarus Corp has 315 million shares, trading at \$10/share, no debt outstanding and no cash balance. The corporate marginal tax rate is 40%.

- a. If you assume that market value is 1.5 times revenues in both businesses, estimate the US\$ cost of capital for Clarus. (2 points)
 - b. Now assume that Clarus plans to borrow \$1.2 billion at 5% (pre-tax) to pay a special dividend of \$450 million and to reinvest the rest (\$750 million) in its technology business in Brazil. Estimate the cost of capital for the company in US\$ after the debt issue and expansion. (4 points)
2. Google is considering entering the retail business. The initial investment to get the retail stores launched is expected to be \$5 billion, depreciable straight line over a lifetime of 10 years to a salvage value of zero. The tax rate for Google is 40% and the company faces a cost of capital of 11%; the cost of capital for specialty retailers is 9%. (Please be explicit about the discount rate that you are using to compute your answers in each part)
- a. Assume that Google expects to stay in the retail business only ten years and that the expected EBITDA margin (EBITDA as a percent of sales) at the stores will be 20%. If revenues are expected to be \$4 billion each year for the next ten years, what is the NPV of this investment? (2 points)

- b. Assume that Google expects to see its advertising revenues change for the next 10 years, as a result of opening the stores. Assuming that the after-tax operating margin in the advertising business is 20%, how much would annual advertising revenues have to change for this project to have a zero net present value? (After-tax operating margin = After tax operating income as % of sales) (2 points)
- c. Finally, assume that Google has been given the option of expensing \$ 2 billion of the \$5 billion initial investment immediately and depreciating the balance of \$3 billion over a 5-year period to a salvage value of zero, instead of ten years. Assuming that the project life stays at 10 years and all of the other inputs are unchanged, how much will the NPV change if Google switches depreciation methods? (2 points)
3. Pelitto Inc. has 100 million shares outstanding, trading at \$50/share. The company has no debt outstanding and no cash balance. Its stock has a beta of 0.90, the risk free rate is 3% and the equity risk premium is 6%.
- a. The company is in stable growth and is expected to generate free cash flows, prior to debt payments but after taxes and reinvestment needs, of \$ 250 million next year. Given the market value of the company, what is the implied growth rate? (1 point)
- b. Now assume that Pelitto plans to borrow \$2 billion at a pre-tax cost of debt of 7% and return the cash to equity investors. If the marginal tax rate is 40%, what effect will the borrowing have on firm value, assuming that your savings grow at the implied growth rate from part a? (2 points)
- c. Assume that cash return (in part b) took the form of a special dividend (the \$2 billion is borrowed and paid out as a dividend). What will the stock price be after the special dividend? (1 point)
- d. Assume that Pelitto uses the \$2 billion to buy back shares (instead of paying a special dividend). What would the buyback price have to be for the remaining shares to see trade at \$51/share after the buyback? (2 points)
4. Nano Media is a young, growing social media company that has just reported net income of \$10 million for the most recent year, on revenues of \$100 million. The company reported capital expenditures (including acquisitions) of \$40 million for the most recent year, significantly higher than the depreciation of \$12 million for the year. Finally, non-cash working capital was \$36 million at the end of the most recent year. Looking forward, the company expects the following for each of these items for the next 3 years:
- Revenues will grow 40% a year, capital expenditures at 15% a year and depreciation at 25% a year, each year for the next 3 years.
 - The table below lists the expectations that the company has for net profit margins (net income as a percent of sales) and non-cash working capital as a percent of sales for the next 3 years:

| | 1 | 2 | 3 |
|------------------------------------|-----|-----|-----|
| Net Margin | 12% | 14% | 16% |
| Total non-cash WC as % of revenues | 30% | 25% | 15% |

- a. The company currently has a cash balance of \$45 million. How much cash will be left after year 3, if it pays no dividends and does not borrow money?
(3 points)
 - b. Assume that the company decides to institute a dividend payout ratio of 20% and also to borrow \$4 million every year for the next three years. How much stock can the company buy back over the three years, if it wants to have a cash balance of \$10 million at the end of year 3?
(3 points)
5. Loma Vista Inc. is a small, publicly traded company that manufactures beachwear and casual apparel. The company generated \$ 10 million in after-tax operating income on revenues of \$100 million in the most recent year. It reported book value (and market value) of debt of \$15 million, book value of equity of \$45 million and a cash balance of \$10 million; the company's return on capital is expected to remain stable in perpetuity. The company has a cost of equity of 15% and a cost of capital of 12% today.
- a. Loma Vista had capital expenditures of \$7 million and depreciation of \$ 5 million in the most recent year. Its working capital increased from \$9 million to \$10 million during the year. Finally, while the company did not do an acquisition last year, it does one acquisition every 5 years at a cost of approximately \$15 million. Assuming that it continues its existing reinvestment policy, estimate the expected free cash flow to the firm each year for the next 3 years.
(3 points)
 - b. At the end of year 3, the company expects growth to drop to 3% a year in perpetuity and its cost of equity will drop to 12% and its cost of capital to 10% after year 3. Estimate the terminal value (end of year 3). (1.5 points)
 - c. Estimate the value of equity per share today, if there are 5 million shares outstanding. (Please be explicit about the discount rate that you are using to compute your value today.) (1.5 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam. For partial credit, when discounting, please show the discount rate that you are using (not just the PV).

1. Alliant Technology is a publicly traded company that sells both computer hardware and services. It has no debt outstanding or cash. In the most recent year, the company reported the following information about its two businesses:

| <i>Business</i> | <i>Revenues (in \$ millions)</i> | <i>Sector Averages</i> | |
|-------------------|----------------------------------|-------------------------------|-----------------------|
| | | <i>Enterprise Value/Sales</i> | <i>Unlevered Beta</i> |
| Computer hardware | \$1,000 | 0.80 | 1.25 |
| Computer services | \$600 | 2.00 | 0.9 |

The company also provides the breakdown of revenues geographically:

| Country | Risk free rate In local currency | Equity Risk Premium | Marginal tax rate | Total Revenues (in \$ millions) |
|---------------|----------------------------------|---------------------|-------------------|---------------------------------|
| United States | 3.00% (US \$) | 5.00% | 40% | \$800.00 |
| China | 4.00% (Yuan) | 7.00% | 25% | \$800.00 |

Both countries have the same mix of hardware & service businesses.

- a. Estimate the cost of equity in US dollars for Alliant Technology (2 points)
 - b. Now assume that Alliant wants to sell just its hardware business in the United States at fair value (based on the EV/Sales ratio for the sector) in the United States, borrow an additional \$400 million in the US and invest the total amount in computer services in China. Estimate the cost of equity in US \$ for Alliant after the transaction. (3 points)
2. Hillsdale Media is a specialty kitchen cabinet maker that produces cabinets to order. It is a mature business that earned EBITDA of \$900,000 on revenues of \$ 5 million in the most recent year and is expected to continue to generate these figures in perpetuity. The company is considering carrying some of its most popular models in inventory, with an eye on increasing sales and operating profits. It has collected the following information:
- To carry inventory, the company will have to invest \$2.25 million in a storage facility, which will be depreciated straight line over ten years down to a salvage value of \$250,000.
 - With the inventory, the company expects its annual revenues to increase to \$7.5 million and its overall EBITDA margin (EBITDA as % of sales) to increase to 20%.
 - For the next decade, the inventory will be maintained at 10% of total revenues, with the investment made at the start of each year. The inventory will be sold for book value at the end of ten years.
 - The cost of capital for the company is 10% and it faces a 40% tax rate.

- a. Estimate the NPV of the project (carrying inventory) assuming at ten-year life for the investment. (4 points)
- b. Estimate the breakeven EBITDA margin for the company, for the investment to have a zero NPV, if you now assume that the project lasts forever. (2 points)
- 3. Voltaire Steel is a highly levered company with 20 million shares, trading at \$10/share and \$800 million in debt (in market and book value terms) outstanding. The pre-tax cost of debt for the company is 10%, the marginal tax rate is 40% and the levered beta for the company is 3.06. The risk free rate is 3% and the equity risk premium is 5%.
 - a. Estimate the cost of capital for the company. (1 point)
 - b. A bondholder in the firm is willing to accept 20 million newly issued shares in the company in exchange for \$200 million in debt (which will be retired). This transaction will raise the company's bond rating to BBB and lower their pre-tax cost of debt to 7.5%. Estimate the new cost of capital, if you go through with the swap. (2 points)
 - c. Assuming that you go through with the swap of equity for debt (from part b), estimate the value per share after the transaction. (You can assume that the firm is in perpetual growth, growing 2% a year forever) (3 points)
- 4. You have been asked to assess the dividend policy of Gallows Inc., a funeral home company that was started as a business on January 1, 2011. You have been provided with the information from its operating history:

| | 2011 | 2012 | 2013 |
|--|---------|---------|---------|
| Revenues | \$1,000 | \$1,100 | \$1,200 |
| Net Income | \$100 | \$110 | \$120 |
| Depreciation | \$40 | \$45 | \$50 |
| Cap Ex | \$50 | \$60 | \$70 |
| Non-cash Working capital (End of year) | \$10 | \$30 | \$60 |
| Total Debt (End of year) | \$10 | \$15 | \$75 |
| Dividend payout ratio | 0% | 40% | 50% |

- a. Assuming that the company started operations on January 1, 2011, with no cash and no debt, how much cash did the company have at the end of each year from 2011 to 2013. (3 points)
- b. Now assume that the company plans to double its non-cash working capital as a percent of revenues and believes that doing so will allow it to grow revenues 20% a year for the next three years, while maintaining the net margin and payout ratio it had in the most recent year. If capital expenditures and depreciation are expected to grow 10% a year and the company intends to repay its existing debt in three equal annual installments, estimate the cash balance three years from now. (You can assume that you are at the start of 2014) (3 points)

5. Calero Inc. is a publicly traded firm, with 25 million shares trading at \$16/share (book value of equity is \$250 million), \$300 million in debt outstanding (market and book value) and \$50 million as a cash balance. The company generated \$60 million in after-tax operating income last year and is expected to maintain its current return on capital in perpetuity. The cost of equity for the firm is 12% and the cost of capital is 10% in perpetuity.
- a. Assuming that the company is expected to grow its operating income 9% a year for the next three years and 3% a year thereafter in perpetuity, estimate the value of the operating assets of the firm today. (4 points)
- b. Given your valuation in part a, how under or over valued is the stock today. (2 points)

Final Exam: Corporate Finance (Spring 2015)

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. GRL Inc. is a publicly traded company that operates in the software and entertainment business, deriving 60% of its value from software and 40% from entertainment. You have collected the following information on comparable firms:

| | Comparable Companies | |
|---------------|----------------------|-----------|
| | Levered Beta | D/E ratio |
| Software | 1.38 | 25% |
| Entertainment | 1.17 | 50% |

GRL has 80 million shares trading at \$10/share and \$200 million in 10-year corporate bonds (with a coupon rate of 4%) outstanding, trading at par. The company also has lease commitments of \$50 million a year for the next 5 years and a marginal tax rate of 40%.

- a. Estimate the current debt to equity ratio (in market value terms) for GRL. (1 point)
 - b. Estimate the levered beta for GRL Inc. (2 points)
 - c. Now assume that GRL plans to sell a portion of its software business and expects to receive \$400 million (it's fair value) from the divestiture. It plans to borrow an additional \$100 million, invest \$300 million of the total proceeds (from the divestiture and the new debt issue) to invest in a social media (online advertising) business and use the rest to buy back stock. If the unlevered beta of social media (online advertising) is 1.50, estimate the levered beta after this transaction. (3 points)
2. ESPN is planning a major expansion into Latin America and has enlisted you in assessing whether it makes sense. You have been given the following information:
- The expansion will require investment in a new studio and broadcasting facilities in Sao Paulo, which will cost \$2 billion (to be spent immediately), depreciable over 10 years to a salvage value of \$500 million.
 - Without the expansion, ESPN expects to generate \$500 million in annual revenues from Latin America each year for the next 10 years, and the expansion will triple those annual revenues. ESPN expects to continue to generate an EBITDA margin of 40% on the incremental revenues.
 - ESPN will allocate \$100 million in G&A costs to the Latin American operations, but 75% of these costs are fixed.
 - The project is expected to last ten years, but to keep the studio technologically updated, ESPN will have to reinvest 20% of its depreciation back into the project every year as maintenance capital expenditures.
 - You can assume that ESPN is all-equity funded and that it faces an effective tax rate of 40% no matter where it operates.
- a. Estimate the expected incremental cash flows for the investment over its 10-year life. (2 points)
 - b. The cost of equity that ESPN (correctly) used for its most recent investment (which was entirely in the US) was 7.7%. (The US Treasury bond rate is 2%, the US equity risk premium is 6% and the additional country risk premium for Latin America is 3%). Estimate the NPV of the Latin American expansion. (2 points)
 - c. Now assume that the Latin American expansion will increase TV viewership in the United States. Assuming that the EBITDA margin for US TV revenues is also 40%, estimate how much annual revenues would have to increase in the United States for the Latin American expansion to be a viable investment. (If you got a positive NPV in part b, solve for how much annual revenues would have to decrease.) (2 points)

Name:

3. Madeira Inc. is a publicly traded company that is considering a restructuring plan. The company currently has 150 million shares trading at \$12/share and total debt outstanding of \$200 million. The firm currently has a (levered) beta of 1.20, the risk free rate is 2%, the equity risk premium is 6% and the marginal tax rate is 40%.

a. The firm is planning **to double its dollar debt** and use the proceeds from the new debt to pay dividends & buy back stock. If it's bond rating will drop to BBB with a default spread of 2.5% over the risk free rate, estimate the cost of capital after the recapitalization. (2 points)

b. You estimate that if the firm doubles its debt, its value as a business will increase by 2%. Estimate the pre-tax cost of debt that currently faces (before recapitalization), if the firm is mature with no growth expected in perpetuity. (2 points)

c. Now assume that the firm plans to use half of the proceeds to buy back stock at \$12.50/share and the other half to pay a special dividend to the remaining shareholders. Estimate the value per share of the remaining shares after the recapitalization. (2 points)

4. You have been asked to assess the dividend policy of Spring Tide Inc., a consumer product company and have been given the last two years of data on the company.

| | 2013 | 2014 |
|--|---------|---------|
| Revenues | \$1,000 | \$1,100 |
| EBITDA | \$500 | \$560 |
| EBIT | \$400 | \$440 |
| Net Income | \$150 | \$180 |
| Total Working Capital (including cash) | \$100 | \$120 |
| Cash (invested in T.Bills) | \$40 | \$80 |
| Total Debt | \$90 | \$120 |

The company also had capital expenditures of \$150 million in 2014 and made a cash acquisition of \$50 million in 2014.

a. If Spring Tide bought back \$50 million of its own stock in 2014, estimate the dividend payout ratio for Spring Tide in 2014. (Dividend payout = Dividends as a percent of net income). (2 points)

b. Now assume that you are told that net income and revenues are expected to grow 20% in 2015, while capital expenditures and depreciation will grow 10%. In addition, the company plans to make no cash acquisitions in 2015, to maintain non-cash working capital at the same percent of revenues as it did in 2014 and to pay out 25% of its net income as dividends. Estimate how much the company can spend on stock buybacks in 2015, if it also wants to increase its cash balance by \$20 million during the year and retire half of its total debt. (3 points)

c. Assuming that you operate in a market where capital gains are taxed at 20%, and dividends are taxed at 40% for all investors. However, investors are allowed to claim a tax credit for taxes paid by company on the income used to pay dividends. If the average effective corporate tax rate is 30%, which of the following would you expect to observe, on average, happening to stock prices on the ex-dividend day?

- i. Stock price will decrease by more than the dividend paid
- ii. Stock price will decrease by less than the dividend paid
- iii. Stock price will increase by more than the dividend paid
- iv. Stock price will increase by less than the dividend paid
- v. Stock price will not change

5. Carbon Springs is a beverage company that reported the following numbers for the most recent fiscal year:

| | Most recent year |
|----------|------------------|
| Revenues | \$2,000.00 |
| EBITDA | \$500.00 |
| DA | \$100.00 |

Name:

| | |
|---------------------|----------|
| EBIT | \$400.00 |
| - Interest expenses | \$50.00 |
| Taxable Income | \$350.00 |
| Taxes | \$105.00 |
| Net Income | \$245.00 |

During the year, the company reported capital expenditures (including acquisitions) of \$200 million and an increase in non-cash working capital of \$40 million. You can assume that the company will continue to generate its current return on invested capital in perpetuity and that its effective tax rate is the marginal tax rate.

- Assuming that operating income will grow at 8% a year for the next five years, estimate the free cash flows to the firm for the next five years. (2 points)
- At the end of year 5, the company is expected to become a mature business, growing at 2% a year in perpetuity with a cost of capital of 8% (mature company levels). Estimate the value of the business at the end of year 5. (2 points)
- Assume that the company's current cost of capital is 12% and is expected to stay at that level for the next 5 years, estimate the value of equity per share today. (The total debt outstanding is \$1 billion, the company's cash balance is \$600 million and there are 150 million shares outstanding.)

Final Exam: Corporate Finance (Spring 2016)

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Thexos Inc. is a company that has operated in two businesses, housewares and food processing, across the US and Mexico, for the last five years. You have a regression of the returns of the stock against the market index (on top) and a breakdown of revenues by country, below.

$$\text{Regression: Returns}_{\text{Thexos}} = 0.20\% + 0.944 \text{ Returns}_{\text{Market Index}}$$

Regional Breakdown

| | Revenues (in \$ millions) | Govt Bond rate (in US \$) | Govt Bond rate (in Pesos) | Marginal tax rate | Equity Risk Premium (Total) |
|--------|---------------------------------|---------------------------------|---------------------------------|-------------------|--------------------------------|
| US | \$800 | 2.00% | NA | 40% | 6.00% |
| Mexico | \$200 | 3.50% | 6.00% | 30% | 8.00% |

The company had an average (market) debt to equity ratio of 30% during the last five years, with all of the debt in the US, but it currently has 150 million shares trading at \$10 per share and no debt outstanding. The marginal tax rate is 40%.

- a. Assuming that the regression beta is the right beta for the equity for the five-year period, estimate the cost of equity for the company in US dollar terms today. (2 points)
 - b. Now assume that the company plans to sell off its housewares business, which accounts for 40% of the current value of the company, for fair value, and hold the cash. If the unlevered beta for housewares is 0.65, estimate the US dollar cost of equity for the company after this transaction. (You can assume that the geographical mix is unaffected). (2 points)
 - c. Now assume that the company plans to sell off its housewares business, which accounts for 40% of the current value of the company, for fair value, and uses the cash from the divestiture to invest in the luxury retail business in Mexico, estimate the cost of equity after this investment. (You can assume that the EV/Sales ratio for the retail business is 1.5 and that the unlevered beta of this business is 1.20) (2 points)
2. Collier Inc. is a firm that currently generates an EBITDA of \$200 million on revenues of \$ 1 billion (all in the US) and is a mature business, with stable margins and growth of 2% a year in perpetuity. The company is considering an expansion opportunity (in the same business) in China, where investing \$1.5 billion will allow the company to double its sales immediately (with the additional sales coming from China), while generating an EBITDA margin of 40% (in perpetuity) on the additional sales. The marginal tax rate is 40%.
- a. Assume that the company currently is all equity funded and uses a (correct) US \$ cost of capital of 6.5% on its US investments. What cost of capital would you use for the China expansion, if the company plans to borrow 20% of the capital needed for the investment at a 5% US \$ interest rate? (The risk free rate in US \$ is 2% and the US ERP is 6%; the ERP in China is 9%) (2 points)
 - b. Assume that 10% of the initial investment will be depreciated each year, but also that capital maintenance will be 110% of depreciation. Estimate the NPV of this investment. (2 points)
 - c. What is the return on equity on the expansion investment and what does it tell you about whether the investment is a good or bad one? (Show the comparison you would make to arrive at your conclusion? (2 points)
3. Xterra Inc. is **an all-equity funded technology company** that is profitable but is seeing growth slacken, as it matures. The company has 25 million shares trading at \$10/share currently and generated \$10 million in operating income in the most recent year. The company's current cost of equity is 6.8%, the risk free rate is 2%, the marginal tax rate is 40% and the equity risk

premium is 6%. You have worked out a schedule of pre-tax costs of debt for the company, at different dollar debt levels:

| \$ Debt (millions) | \$0 | \$25 | \$50 | \$75 | \$100 | \$125 | \$150 | \$175 | \$200 | \$225 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Pre-tax cost of debt | 3.00% | 3.25% | 3.60% | 4.00% | 4.50% | 5.00% | 6.00% | 7.80% | 9.00% | 12.00% |

- Assume that the company plans to borrow \$100 million and buy back shares at \$12.5/share. Estimate the value per share for the remaining shares after the buyback. (You can assume that the firm is stable and will generate its current operating income with no growth forever) (3 points)
 - Now instead of the recapitalization in part (a), assume now that you could borrow \$175 million to do a leveraged buyout of the company (where you plan to buy all the shares @\$10/share and take the company private). How much will your equity investment be worth after the transaction? (3 points)
4. You have been given the task of assessing how much FinServe Bank, a small bank with regulatory capital shortfalls, can pay out in dividends over the next 5 years. The bank held \$200 million in regulatory capital (which you can assume is also equal to book value of equity) on risk-adjusted assets of \$2 billion. It earned net income of \$20 million in the most recent year. The table below provides projections of return on equity and targeted regulatory capital ratios for the next 5 years:

| Year | Most recent year | 1 | 2 | 3 | 4 | 5 |
|--------------------------|------------------|-------|-------|-------|-------|-------|
| ROE | 10.0% | 11.0% | 12.0% | 13.0% | 14.0% | 15.0% |
| Regulatory Capital Ratio | 10.0% | 10.5% | 11.0% | 11.5% | 12.0% | 12.5% |

- Assuming that risk-adjusted assets are expected to increase 5% a year for the next five years, estimate the FCFE each year for the next 5 years. (3 points)
 - Now assume that the bank wants to maintain its policy of paying out 40% of its net income as dividend each year for the next five years. Estimate the regulatory capital ratio in year 5, if the bank issues no new equity. (2 points)
 - Now assume that you are an investor who likes dividends and would like to invest in banks that not only pay high dividends but can securely continue to do so in future years. Holding asset growth constant, which of the following combination of characteristics would you most like to find in a bank?
 - Increasing ROE and stable regulatory capital ratio
 - Increasing ROE and rising regulatory capital ratio
 - Increasing ROE and decreasing regulatory capital ratio
 - Decreasing ROE and stable regulatory capital ratio
 - Decreasing ROE and rising regulatory capital ratio
 - Decreasing ROE and decreasing regulatory capital ratio
5. Delta General is a publicly traded company and you have been provided the following information on its expected revenues and after-tax operating income (in \$ millions), each year for the next 5 years:

| | Last year | 1 | 2 | 3 | 4 | 5 |
|----------------------|------------|------------|------------|------------|------------|------------|
| Expected Growth rate | | 8.00% | 8.00% | 8.00% | 8.00% | 8.00% |
| Revenues | \$1,000.00 | \$1,080.00 | \$1,166.40 | \$1,259.71 | \$1,360.49 | \$1,469.33 |
| EBIT (1-t) | \$120.00 | \$129.60 | \$139.97 | \$151.17 | \$163.26 | \$176.32 |

The company currently has 150 million shares trading at \$10/share (book value of equity=\$500 million). The company also had \$400 million in debt outstanding (book and market value) and \$300 million in cash. The cost of capital for the firm is expected to be 12% for the next 5 years and drop to 8% thereafter.

Name:

- a. Assuming that the firm's return on invested capital stays at its current level for the next 5 years, estimate the free cash flow to the firm each year for the next five years.
(2 points)
- b. After year 5, you expect the firm's return on invested capital to halve (from current levels) and the expected growth rate to drop to 2% a year in perpetuity. Estimate the terminal value at the end of year 5. (1.5 points)
- c. Estimate the value of equity per share today. (2.5 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Sumi Inc. is an all-equity funded company that is incorporated in Thailand but gets a large portion of its revenue in the US, while operating in two businesses: steel and chemicals. You have been provided the geographic and business breakdown for the value of the company in the table below (in millions of US\$):

| Country | Steel | Chemicals | ERP for Country |
|------------------------------------|-------------|-------------|-----------------|
| US | \$800 | \$200 | 5.00% |
| Thailand | \$400 | \$100 | 7.25% |
| Unlevered beta for business | 1.20 | 0.90 | |

The US treasury bond rate is 2.5% and the Thai US\$ Government bond rate is 4.5%. Estimate the cost of equity for the company in US dollar terms. (4 points)

2. Collins Inc. is a publicly traded company with a market capitalization (market value of equity) of \$900 million and \$100 million in interest-bearing debt. You have computed a cost of capital for the company based on this mix:

| | Market Value (in millions US\$) | % of Capital | Cost of component |
|---------|---------------------------------|--------------|-------------------|
| Debt | \$100.00 | 10.00% | 3.00% (after tax) |
| Equity | \$900.00 | 90.00% | 9.00% |
| Capital | \$1,000.00 | 100.00% | 8.400% |

Reviewing your calculations, you realize that while the unlevered beta (used to estimate a levered beta and a cost of equity) and cost of debt estimates are right, you forgot to capitalize lease commitments, which amount to \$120 million a year, each year for the next ten years. If you capitalize leases (and treat them as debt), estimate the correct cost of capital for the company. (The riskfree rate is 3%, the equity risk premium is 5% and the marginal tax rate is 40%) (3 points)

3. You have been asked to estimate the NPV of an investment in a new 3-year venture for a telecomm firm.
- The initial investment is expected to be \$1 billion and will be depreciated straight line over three years to a salvage value of \$100 million at the end of the third year.
 - During the three years, working capital is expected to be 15% of revenues and the investment has to be made at the start of each year; it can be fully salvaged at the end of the project.
 - The cost of capital for the investment is 9% and the tax rate is 30%.
 - The project is expected to have the following revenues and EBITDA for the next 3 years (in millions of dollars)

| | 1 | 2 | 3 |
|----------|------------|------------|------------|
| Revenues | \$1,000.00 | \$1,200.00 | \$1,500.00 |
| EBITDA | \$300.00 | \$400.00 | \$600.00 |

Estimate the NPV for this project. (4 points)

4. Underpaid at your job, you are considering becoming an Uber driver. While you believe that you can make \$12/hour after taxes and vehicle maintenance costs, driving 800 hours a year, you also recognize that you will need to buy a more expensive car (than

the one you would normally buy) and that the car will not last as long, if you drive for Uber:

| | <i>Without Uber</i> | <i>With Uber</i> |
|--------------------------------|---------------------|--------------------------------|
| Cost of car | \$15000 | \$25000 |
| Car life (in years) | 5 | 3 |
| Salvage value (at end of life) | \$5,000 | \$4,000 |
| Depreciation method | None | Straight line for tax purposes |

If your tax rate is 40% and your discount rate is 8%, estimate the annual after-tax income you will earn as an Uber driver, with the incremental car costs factored in. (You can assume that your income will stay constant over time, as will the car related costs in this table). (4 points)

5. Maxim Enterprises currently has the following capital structure (with associated costs):

| | Market Value | Cost of Component (after taxes) |
|----------|--------------|---------------------------------|
| Debt = | \$400.00 | 2.40% |
| Equity = | \$600.00 | 9.30% |
| Capital | \$1000.00 | 6.54% |

The company is expected to generate \$48 million in operating income next year and face a marginal tax rate of 40% on taxable income. If Maxim borrows \$400 million and buys back stock, you believe that this will double the pre-tax cost of debt. Estimate the cost of capital for the firm after the recapitalization. (The risk free rate is 3% and the equity risk premium is 5%.) (4 points)

6. Conway Inc. has 125 million shares, trading at \$8/share, no debt and a cost of equity of 9%. You believe that if the company is able to borrow \$400 million and buy back shares, the cost of capital will drop to 8%. If there is no growth in the savings (from a lower cost of capital) and the shares are bought back at \$10/share, estimate the value per share for the remaining shares after the buyback. (3 points)

7. Roslyn Inc. is a small, publicly traded company that had revenues of \$250 million in the most recent year, while breaking even (a profit of zero). Currently, the company has total working capital of \$35 million, which includes a cash balance of \$25 million. The table below provides estimates of revenues and net profit margins for the company, for the next five years.

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------|----------|------------|------------|------------|------------|
| Revenue (in millions) | \$750.00 | \$1,000.00 | \$1,200.00 | \$1,350.00 | \$1,500.00 |
| Net Profit Margin | 2% | 3% | 4% | 5% | 6% |

The company plans to keep its non-cash working capital, as a percent of revenues, constant for the next five years and has no significant capital expenditures or depreciation over that period. If the company plans to return no cash in years 1 and 2, and pay out 40% of net income as dividends in years 3-5, estimate how much of a cash balance it will have at the end of year 5. (4 points)

8. You are trying to value Hollow Inc. and have estimated the following cash flows for the firm for its high growth period:

| | | | | |
|--|-----------|---|---|---|
| | Last year | 1 | 2 | 3 |
|--|-----------|---|---|---|

Name:

| Expected Growth Rate | | 7.5% | 7.5% | 7.5% |
|----------------------|----------|----------|----------|----------|
| EBIT (1-t) | \$100.00 | \$107.50 | \$115.56 | \$124.23 |
| + Depreciation | \$20.00 | \$21.50 | \$23.22 | \$25.08 |
| - Cap Ex | \$80.00 | \$86.00 | \$92.88 | \$100.31 |
| FCFF | \$40.00 | \$43.00 | \$45.90 | \$49.00 |
| Cost of capital | | 10% | 10% | 10% |

After year 3, Hollow Inc. is expected to be a mature firm, growing 2.5% a year in perpetuity with a cost of capital of 8%. If the company will earn the same return on capital (as it is expected to earn in years 1-3) in perpetuity, estimate the terminal value of the firm, i.e., the value of the firm at the of year 3. (4 points)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Zegala Inc. is an all-equity funded company that operates in two businesses and derives all of its revenues in the United States.

| | Estimated Value (in \$ millions) | Unlevered Beta |
|-----------------|----------------------------------|----------------|
| Hotels | \$500.00 | 0.90 |
| Travel Services | \$1,000.00 | 1.20 |
| Company | \$1,500.00 | 1.10 |

The firm is considering borrowing \$1.5 billion and expanding its hotel business into Mexico. The US 10-year T.bond rate is 3%, the Mexican government 10-year peso rate is 8% the equity risk premium for the US is 5% and the equity risk premium for Mexico is 7.5%. Estimate the **cost of equity in US \$ terms** for the company, after the expansion. (The marginal tax rate is 25%) (4 points)

2. You have been asked to estimate the cost of capital for Lemur Enterprises, a company with a significant debt load, and a depressed stock price. You have the following information:

- The company has a book value of equity of \$1 billion. There are 150 million shares, trading at \$4/share. The unlevered beta of other companies in the same business is 1.20.
- The company has bank loans outstanding of \$1 billion, with 5 years left to maturity and interest expenses of \$40 million a year. The company currently has a CCC bond rating and has a default spread of 7% over the riskfree rate.
- The firm reported a net loss of -\$15 million, but its operating income is expected to be \$32 million next year.
- The risk free rate is 3%, the equity risk premium is 5% and the marginal tax rate for all companies is 25%.

Estimate the cost of capital for the company, for next year. (4 points)

3. You have been hired by a movie company and asked whether they should invest in a streaming service, and have collected the following information:

- The company will have to spend \$2 billion in acquiring a proprietary streaming product. This investment will be depreciated straight line over five years to a salvage value of zero.
- You expect to have 25 million subscribers, paying \$100/year, for the next five years and the operating expenses (not including depreciation) of servicing these subscribers to be 60% of revenues.
- The cost of capital is 8% and the marginal tax rate is 25%.
- To provide exclusive content on its streaming, the company will have to pull movies that it now shows on Netflix and forfeit \$500 million in licensing fees (pre tax) that it would have received every year for the next five years.

Estimate the net present value of the streaming service, assuming that it will be wound up in five years. (4 points)

4. You work for a Genome Drugs, small biotechnology company that has a 10-year patent for a drug that it plans to license to a larger pharmaceutical company and it has two offers:

- Biogen has offered to pay \$100 million today and \$50 million a year, each year **for the next 5 years**.
- Merck has offered to pay \$50 million today and share 15% of net income, expected to be \$400 million annually, each year **for the next 10 years**.

The following table lists financing costs of Pfizer and Merck:

| | After-tax cost of debt | Pre-tax cost of debt | Cost of equity | Cost of capital |
|--------|------------------------|----------------------|----------------|-----------------|
| Biogen | 3.75% | 5.00% | 12.00% | 10.00% |
| Merck | 3.00% | 4.00% | 9.00% | 7.50% |

Which offer would create more value for you? (4 points)

5. Marley Inc. is a small, publicly traded music producer, with 20 million shares trading at \$15/share and no debt. The company announces that it will borrow money to move to a debt to capital ratio of 20% and lower its cost of capital to 7.5%. If the stock price jumps to \$15.90 on the announcement, **investors are rational** and there is no growth in the financing cost savings over time, **estimate the beta for the company after the borrowing**. The risk free rate is 3%, the equity risk premium is 5% and the marginal tax rate is 25%. (4 points)

6. Minster Inc. is examining its dividend policy and has provided you with the following information:

| | 1 | 2 | 3 |
|------------------------------------|------------|------------|------------|
| Revenues | \$1,200.00 | \$1,400.00 | \$1,600.00 |
| Net Income | \$30.00 | \$70.00 | \$160.00 |
| Total Non-cash WC as % of revenues | 12.00% | 9.00% | 6.00% |
| Dividend Payout | 0.00% | 10.00% | 20.00% |

- The non-cash working capital currently is \$150 million and the company has a cash balance right now of \$50 million.
- In the most recent year, depreciation amounted to \$75 million and capital expenditures were \$125 million. You expect depreciation to grow 10% a year and capital expenditures to increase 8% a year, each year for the next 3 years.

Assuming that the company would like to **double its cash balance** by the end of year 3 and **do a stock buyback** in year 3, estimate how much cash the company will have available for its buyback. (5 points)

7. Justin Enterprises, a **company with a 9% cost of capital**, reported the following numbers in its financial statements for the most recent year:

| <i>Income Statement</i> | | <i>Balance Sheet</i> | | | |
|-------------------------|----------|----------------------|-----|------|-----|
| Revenues | \$500.00 | Fixed Assets | 500 | Debt | 200 |

| | | | | | |
|------------------|----------|--------------------------|-----|--------|-----|
| EBITDA | \$150.00 | Non-cash Working Capital | 125 | Equity | 550 |
| DA | \$50.00 | Cash | 125 | | |
| EBIT | \$100.00 | Total | 750 | Total | 750 |
| Interest Expense | \$20.00 | | | | |
| EBT | \$80.00 | | | | |
| Taxes | \$20.00 | | | | |
| Net Income | \$60.00 | | | | |

In the most recent year, the company also reported capital expenditures of \$90 million and an increase in working capital of \$ 10 million. Justin will continue to reinvest at the same rate as it did in the most recent year and generate the same return on invested capital it earned in the most recent year, for the next three years. If after year 3, it becomes a mature firm, growing 3% a year in perpetuity (while maintaining its current return on capital), **estimate the value of the equity today**. (5 points)

| | | NUMBER OF YEARS IN ANNUITY | | | | | | | | | | | | |
|---|--------|----------------------------|--------|--------|--------|--------|--------|--------|--|--------|---------|---------|---------|---------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 20 | 25 |
| DISCOUNT RATE | 0% | 1.0000 | 2.0000 | 3.0000 | 4.0000 | 5.0000 | 6.0000 | 7.0000 | 8.0000 | 9.0000 | 10.0000 | 15.0000 | 20.0000 | 25.0000 |
| | 1% | 0.9901 | 1.9704 | 2.9410 | 3.9020 | 4.8534 | 5.7955 | 6.7282 | 7.6517 | 8.5660 | 9.4713 | 13.8651 | 18.0456 | 22.0232 |
| | 2% | 0.9804 | 1.9416 | 2.8839 | 3.8077 | 4.7135 | 5.6014 | 6.4720 | 7.3255 | 8.1622 | 8.9826 | 12.8493 | 16.3514 | 19.5235 |
| | 3% | 0.9709 | 1.9135 | 2.8286 | 3.7171 | 4.5797 | 5.4172 | 6.2303 | 7.0197 | 7.7861 | 8.5302 | 11.9379 | 14.8775 | 17.4131 |
| | 4% | 0.9615 | 1.8861 | 2.7751 | 3.6299 | 4.4518 | 5.2421 | 6.0021 | 6.7327 | 7.4353 | 8.1109 | 11.1184 | 13.5903 | 15.6221 |
| | 5% | 0.9524 | 1.8594 | 2.7232 | 3.5460 | 4.3295 | 5.0757 | 5.7864 | 6.4632 | 7.1078 | 7.7217 | 10.3797 | 12.4622 | 14.0939 |
| | 6% | 0.9434 | 1.8334 | 2.6730 | 3.4651 | 4.2124 | 4.9173 | 5.5824 | 6.2098 | 6.8017 | 7.3601 | 9.7122 | 11.4699 | 12.7834 |
| | 7% | 0.9346 | 1.8080 | 2.6243 | 3.3872 | 4.1002 | 4.7665 | 5.3893 | 5.9713 | 6.5152 | 7.0236 | 9.1079 | 10.5940 | 11.6536 |
| | 8% | 0.9259 | 1.7833 | 2.5771 | 3.3121 | 3.9927 | 4.6229 | 5.2064 | 5.7466 | 6.2469 | 6.7101 | 8.5595 | 9.8181 | 10.6748 |
| | 9% | 0.9174 | 1.7591 | 2.5313 | 3.2397 | 3.8897 | 4.4859 | 5.0330 | 5.5348 | 5.9952 | 6.4177 | 8.0607 | 9.1285 | 9.8226 |
| | 10% | 0.9091 | 1.7355 | 2.4869 | 3.1699 | 3.7908 | 4.3553 | 4.8684 | 5.3349 | 5.7590 | 6.1446 | 7.6061 | 8.5136 | 9.0770 |
| | 11% | 0.9009 | 1.7125 | 2.4437 | 3.1024 | 3.6959 | 4.2305 | 4.7122 | 5.1461 | 5.5370 | 5.8892 | 7.1909 | 7.9633 | 8.4217 |
| | 12% | 0.8929 | 1.6901 | 2.4018 | 3.0373 | 3.6048 | 4.1114 | 4.5638 | 4.9676 | 5.3282 | 5.6502 | 6.8109 | 7.4694 | 7.8431 |
| | 13% | 0.8850 | 1.6681 | 2.3612 | 2.9745 | 3.5172 | 3.9975 | 4.4226 | 4.7988 | 5.1317 | 5.4262 | 6.4624 | 7.0248 | 7.3300 |
| | 14% | 0.8772 | 1.6467 | 2.3216 | 2.9137 | 3.4331 | 3.8887 | 4.2883 | 4.6389 | 4.9464 | 5.2161 | 6.1422 | 6.6231 | 6.8729 |
| | 15% | 0.8696 | 1.6257 | 2.2832 | 2.8550 | 3.3522 | 3.7845 | 4.1604 | 4.4873 | 4.7716 | 5.0188 | 5.8474 | 6.2593 | 6.4641 |
| | 16% | 0.8621 | 1.6052 | 2.2459 | 2.7982 | 3.2743 | 3.6847 | 4.0386 | 4.3436 | 4.6065 | 4.8332 | 5.5755 | 5.9288 | 6.0971 |
| | 17% | 0.8547 | 1.5852 | 2.2096 | 2.7432 | 3.1993 | 3.5892 | 3.9224 | 4.2072 | 4.4506 | 4.6586 | 5.3242 | 5.6278 | 5.7662 |
| | 18% | 0.8475 | 1.5656 | 2.1743 | 2.6901 | 3.1272 | 3.4976 | 3.8115 | 4.0776 | 4.3030 | 4.4941 | 5.0916 | 5.3527 | 5.4669 |
| | 19% | 0.8403 | 1.5465 | 2.1399 | 2.6386 | 3.0576 | 3.4098 | 3.7057 | 3.9544 | 4.1633 | 4.3389 | 4.8759 | 5.1009 | 5.1951 |
| | 20% | 0.8333 | 1.5278 | 2.1065 | 2.5887 | 2.9906 | 3.3255 | 3.6046 | 3.8372 | 4.0310 | 4.1925 | 4.6755 | 4.8696 | 4.9476 |
| | 21% | 0.8264 | 1.5095 | 2.0739 | 2.5404 | 2.9260 | 3.2446 | 3.5079 | 3.7256 | 3.9054 | 4.0541 | 4.4890 | 4.6567 | 4.7213 |
| | 22% | 0.8197 | 1.4915 | 2.0422 | 2.4936 | 2.8636 | 3.1669 | 3.4155 | 3.6193 | 3.7863 | 3.9232 | 4.3152 | 4.4603 | 4.5139 |
| | 23% | 0.8130 | 1.4740 | 2.0114 | 2.4483 | 2.8035 | 3.0923 | 3.3270 | 3.5179 | 3.6731 | 3.7993 | 4.1530 | 4.2786 | 4.3232 |
| | 24% | 0.8065 | 1.4568 | 1.9813 | 2.4043 | 2.7454 | 3.0205 | 3.2423 | 3.4212 | 3.5655 | 3.6819 | 4.0013 | 4.1103 | 4.1474 |
| 25% | 0.8000 | 1.4400 | 1.9520 | 2.3616 | 2.6893 | 2.9514 | 3.1611 | 3.3289 | 3.4631 | 3.5705 | 3.8593 | 3.9539 | 3.9849 | |
| HOW TO USE THIS TABLE: PV OF OF A 10-YEAR ANNUITY (OF \$1) WITH A 12% DISCOUNT R | | | | | | | | 5.6502 | (Look under 10 years on the top axis and for 12% in the vertical axis) | | | | | |
| IF YOU HAVE \$50 MILLION A YEAR FOR 10 YEARS, @12% = | | | | | | | | 282.51 | 50*6.6502 | | | | | |

Final Exam: Spring 2022

Problem 1

Carone Inc. is a company that operates in two businesses - iron ore mining and steel manufacturing. Its equity market capitalization is currently \$1.2 billion, debt outstanding of \$800 million (market and book) and it has negligible cash. You have computed the company's current levered beta, based on its business and debt mix, correctly to be 1.26. Carone is planning to sell off its entire mining business for its fair value, which is \$500 million, and use the proceeds to pay \$200 million in special dividends and retire \$300 million in debt. Estimate the levered beta for the company after this transaction. (The mining business has an unlevered beta of 0.60 and the corporate marginal tax rate is 25%.)

Problem 2

You have been asked to compute the current cost of capital for Lorax, a highly levered company, and have collected the following information:

- The company has 50 million shares outstanding, trading at \$15/share. The current cost of equity is 12%.
 - The company has \$1.25 billion in interest bearing debt, with a coupon rate of 4% and a weighted maturity of 10 years.
 - The company is rated B and the interest rate at the rating is 8%
 - Lorax expects to generate \$30 million in EBIT next year
- The marginal tax rate is 30%. Estimate the cost of capital for the company for next year.

Problem 3

Rapini Inc. is a grocery store chain that is considering making a major investment in a logistics project, and has provided you with the following details:

- The project will cost \$100 million up front, depreciable straight line over five years to a salvage value of zero
- Making the logistics investment will reduce its annual operating expenses by \$25 million for the next 5 years
- The company currently has \$80 million invested in inventory, but making the logistics investment will allow it to *reduce its inventory as follows at the end of each year, for the next five years and beyond:*

| | Current | End of year 1 | End of year 2 | End of year 3 | End of year 4 | End of Year 5 & beyond |
|-------------------------|---------|---------------|---------------|---------------|---------------|------------------------|
| Inventory (in millions) | \$80.00 | \$74.00 | \$68.00 | \$62.00 | \$56.00 | \$50.00 |

- The cost of capital is 8% and the corporate tax rate is 20%

Estimate the NPV from this project, assuming that the drop in inventory can be maintained permanently,

Problem 4

Shetland Inc. is a publicly traded company trying to pick between two vendors for its security and technology needs,

| | Vendor 1 | Vendor 2 | Vendor 3 |
|---------------------|----------|----------|----------|
| Initial set up cost | \$10,000 | \$5,000 | \$30,000 |
| Contract period | 5 | 3 | 10 |
| Annual cost | \$3,000 | \$4,000 | \$0 |

If Shetland's cost of capital is 8%, which option is the less expensive one?

Problem 5

You are planning to use the APV model to estimate effect of debt at Galludet Inc. and as prelude, you are trying to estimate the unlevered beta of the company. The company currently has \$1.2 billion in market capitalization (market value of equity) and \$ 800 million in net debt, and have collected the following information.

- The company faces a marginal tax rate of 25% and has enough income to cover interest expenses.
 - The company is currently rated BB, and you estimate that bonds with that rating have a 20% chance of default.
 - You estimate that the direct and indirect costs of bankruptcy amount to 30% of enterprise value.
- Estimate the unlevered value of Galludet (i.e., if it has no debt)

(For simplicity, you can assume that the debt is perpetual and that the interest rate on the debt is 5%)

Problem 6

You have run a regression of dividend payout ratios against fundamentals (variables that you think determine payout ratios) across all US firms:

Payout Ratio = 0.40 - 3.00 (Expected compounded annual growth rate in net income next 5 years) + 1.50 (Return on Equity) -.05 (Levered Beta)

(In the regression, enter percentage values as decimals. If your ROE is 25%, enter 0.25)

You are using this regression to predict the payout ratio for Pellegrino Inc. a beverage company:

- Pellegrino reported net income of \$10 million last year, which it expects to double to \$20 million by year 5.
- Pellegrino has a market capitalization of \$100 million and trades at a price to book ratio of 2.00.

- c. Pellegrino has total debt of \$40 million (market and book) and faces a tax rate of 25%.
 d. The unlevered beta of being in the beverage business is 0.80, and the marginal tax rate is 25%.
 Estimate the payout ratio for Pellegrino, with the regression

Problem 7

| | Last year | 1 | 2 | 3 |
|---|------------|------------|------------|------------|
| Revenues (millions) | \$1,000.00 | \$1,200.00 | \$1,350.00 | \$1,500.00 |
| Net Margin | | 3% | 5% | 10% |
| Payout Ratio | | 10% | 25% | 40% |
| Depreciation/Revenues | | 2% | 2% | 2% |
| Cap Ex/Depreciation | | 150% | 125% | 125% |
| Total Non-cash Working Capital as % of Revenues | 10% | 10% | 8% | 8% |

If the company currently has a cash balance of \$50 million, estimate the cash balance at the end of year 3.

Problem 8

Varitek inc is a publicly traded company that generated \$ 80 million in after tax operating income in the most recent year, on invested capital of \$500 million. The company had capital expenditures of \$60 million, depreciation of \$30 million and saw non-cash working capital increase from \$60 million to \$80 million in the most recent year. Assuming that this company can maintain its return on capital and reinvestment rate for the next three years, and that the expected growth rate will drop to 2.5% after year 3 (with return on capital staying at current levels), estimate the value of the operating assets today. (The cost of capital is 9% for the next three years and 7.5% thereafter.)

Corporate Finance: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Litnik Inc. is a highly indebted firm that operates in steel and mining; it gets 60% of its value from mining and 40% from steel. The firm is fairly valued at the moment and has a beta (levered) of 3.60; it has 40 million shares outstanding trading at \$10/share, and \$1.6 billion in debt. The firm is considering **selling its steel business for fair value, which has an unlevered beta of 1.20, and using the cash from the sale to retire debt**. Estimate the levered beta for Litnik Inc., after this transaction. (The marginal tax rate is 25%) (3 points)

2. Aldo Inc. is a German entertainment business that is considering expanding into the publishing business in Turkey, and you have the following information:

| | German Company | Turkish project |
|-----------------------|----------------|-----------------|
| Business | Entertainment | Publishing |
| Currency | Euro | Lira |
| Riskfree rate | 2.00% | 12.00% |
| Unlevered beta | 1.10 | 0.75 |
| ERP | 6.00% | 11.00% |
| Marginal tax rate | 30.00% | 20.00% |
| Debt to capital ratio | 40.00% | |
| Default spread | 3.00% | |

- Estimate the cost of capital, in Euros, for the Turkish publishing project, assuming that Aldo borrow money in Turkey for the project, but uses the same debt to capital ratio and faces the same default spread that it currently has in Germany. (3 points)
3. Zita's Pizzeria is a well-regarded Italian restaurant that is considering plans to introduce a frozen-food entrée, for sale in a grocery stores.
 - It will require an initial investment of \$5 million, that will be depreciated straight line down to a salvage value of zero.
 - The entrée is expected to generate \$160,000 in after-tax operating income each year for the next five years.
 - The sales of the frozen food entrée is expected to increase the after-tax operating income at the restaurant by \$100,000 each year for the next five years
 - The cost of capital is 12% for the restaurant business and 8% for the food processing business.
 Estimate the NPV of this investment. (4 points)

 4. You work for a small pharmaceutical company that has come up an innovative, patented treatment for bed sores, and you are considering either licensing it to a pharmaceutical company that will share 20% of revenues (expected to be \$175 million a year) with you, for the next five years, or to the US government that will

pay you a guaranteed licensing fee of \$20 million a year, for the next eight years. (All numbers are in \$ millions and the marginal tax rate is 25%.)

| | Revenue-sharing Pharma | US Government |
|---------------------------------------|------------------------|---------------|
| Number of years | 5.00 | 8.00 |
| Initial cost in getting product ready | -\$80.00 | -\$60.00 |
| Expected License revenues/year | \$35.00 | \$20.00 |

If the initial cost is depreciable, straight line, over the project lifetime, the riskfree rate is 3% and the cost of capital for pharmaceutical companies is 9%, which is the better choice for you? (You can assume that both agreements are renewable, when they expire, at the same terms that they are offering today.) (3 points)

5. Garibaldi Inc. is a mature chemical company, with the following characteristics for its current cost of capital:

| Cost of equity | Cost of debt (pre-tax) | Cost of debt (after-tax) | Debt to capital ratio | Cost of capital |
|----------------|------------------------|--------------------------|-----------------------|-----------------|
| 8.52% | 4.00% | 2.40% | 20.00% | 7.30% |

Estimate the effects of doubling the debt to capital ratio of Garibaldi Inc., which you believe will triple the company's default spread, on the cost of capital (The riskfree rate is 3% and the equity risk premium is 6%) (3 points)

6. Calderon Inc. is a publicly traded company, with 100 million shares outstanding, trading at \$18/share, and \$900 million in debt outstanding. The company is considering borrowing \$900 million and buying back shares at \$21/share, which is a rational price, assuming no growth in perpetuity in savings from a lower cost of capital. If the cost of capital after the buyback is 7.50%, estimate the cost of capital before the buyback. (Rational price = Every shareholder, selling or not selling back, gets an equal share of the increase in value. (3 points)

7. Middle State Utilities is a power utility that pays significant dividends each year, as an annual dividend (rather than in quarterly dividends). The stock price is trading at \$25, cum-dividend, and has announced a dividend per share of \$2.00. Both dividends and short term (held for less than one year) capital gains are taxed at 30% a year, but long-term capital gains are tax exempt. If the ex-dividend stock price is \$23.19, estimate the proportion of capital gains, for the typical investor in this stock, that are long term. (3 points)

8. Nikita Inc. is a small publicly traded company that has never paid a dividend, partly because it has never made money. You have been given the following information on the company:

| | <i>Most recent year</i> | <i>1</i> | <i>2</i> | <i>3</i> |
|---|-------------------------|---------------------|----------|----------|
| Revenues (in \$ millions) | \$500.00 | \$1,000 | \$1,200 | \$1,500 |
| Net margin | -10.00% | -5.00% | 2.00% | 10.00% |
| Depreciation (in \$ millions) | \$150.00 | Grows at 10% a year | | |
| Cap Ex (in \$ million) | \$200.00 | Grows at 5% a year | | |
| Non-cash Working capital (as % of revenues) | 10.00% | 10.00% | 8.00% | 6.00% |

The company currently has a cash balance of \$200 million, and would like to have a cash balance of \$125 million at the end of year 3. How much can Nikita afford to pay in dividends over the next three years? (4 points)

9. Glynda Inc. is a publicly traded firm that generated \$120 million in after-tax operating income; it started the year with book value of equity of \$750 million, book value of debt of \$400 million and a cash balance of \$150 million. You have been given the expected growth rate in operating income, for the next three years:

| | 1 | 2 | 3 |
|---|--------|-------|-------|
| Growth rate in after-tax operating income | 12.00% | 8.00% | 4.00% |

The firm is expected to continue earning its current return on invested capital in perpetuity, but the expected growth rate is expected to drop after year 3 to 2%. If the cost of capital is 10% for the next 3 years and 8% thereafter, **estimate the value of the equity per share today, if there are 80 million shares outstanding.** (4 points)

Final Exam: Corporate Finance

Answer all questions and show necessary work. Please be brief. This is an open-book, open-notes exam.

1. You have been asked to analyze Canyon Group, a publicly traded company in two businesses. The following table summarizes the estimated values of the two businesses, and the firm's funding mix (in \$ millions):

| Assets (in market value terms) | | Liabilities & Equity (market value) | |
|--------------------------------|----------|-------------------------------------|----------|
| Food | \$800.00 | Debt | \$200.00 |
| Hotels | \$200.00 | Equity | \$800.00 |

Canyon Group currently has a levered beta of 0.95 and faces a marginal tax rate of 25%. Canyon Group is planning to sell its hotel business at fair value (estimated above), which has an unlevered beta of 1.20, and pay off the debt outstanding. Estimate the **beta for Canyon after the divestiture**. (3 points)

2. Robert Furnishings is a publicly traded company, with 80 million shares outstanding, trading at \$10 a share. The company has no conventional debt, but it does have contractual commitments of \$100 million a year for the next five years. The unlevered beta of furnishing companies is 1.20, the marginal tax rate is 25% and the company has a bond rating of A (with a default spread of 1.10%). If the riskfree rate is 4.50% and the equity risk premium is 5%, **estimate the cost of capital for the firm**. (3 points)

3. Libertini's Restaurant is considering switching from using DoorDash, largely because they lose 10% of their revenues to Doordash, to their own delivery app, with lower revenues but with all revenues accruing to the restaurant. The table provides a comparison of annual operating numbers, with DoorDash & their own app.

| | <i>Continue with DoorDash</i> | <i>With own app</i> |
|---------------------|-------------------------------|---------------------|
| Revenues | \$500,000.00 | \$450,000.00 |
| Labor and Materials | \$300,000.00 | \$270,000.00 |
| App share | \$50,000.00 | \$0.00 |
| Operating Income | \$150,000.00 | \$180,000.00 |

If Libertini's faces a marginal tax rate of 25% and a cost of capital of 10%, **what is the most that Libertini's can afford to spend (right now) on developing its own delivery app?** (You can assume that the app development cost will be expensed immediately, and that the app has a ten-year life). (3 points)

4. You are reviewing the NPV calculated for a project by an analyst and checking for errors. The analyst estimated a net present value of \$50 million, but he ignored working capital investments in making the computation. You have estimated the expected revenues and working capital as a percent of revenues below:

| | 1 | 2 | 3 | 4 |
|----------------------------------|----------|------------|------------|------------|
| Revenues (in \$ millions) | \$800.00 | \$1,000.00 | \$1,250.00 | \$1,500.00 |
| Working Capital as % of revenues | 15.00% | 15.00% | 10.00% | 6.00% |

Assuming that working capital investments have to be made at the start of each year, that the working capital can be fully salvaged when the project ends after 4 years and that the cost of capital is 9%, **estimate the corrected NPV for this investment.** (3 points)

5. Galway Inc. is a chemical company that is significantly over levered, with \$600 million in debt and \$150 million in equity; the pre-tax cost of debt is 10% and the levered beta is 3.15; the company is expected to generate \$48 million in earnings before interest and taxes next year. Assume that Galway can raise \$450 million in new equity and use all of the proceeds to retire debt, and that this action will bring the pre-tax cost of debt down to 6%. **Estimate the change in the cost of capital from the action.** (The riskfree rate is 4.5%, the equity risk premium is 5% and the marginal tax rate is 25%.) (3 points)

6. Vertigo Movies. is an entertainment company, with 125 million shares trading at \$8 per share and debt of \$250 million. The company is considering borrowing \$225 million and buying back shares at \$9 a share. Assuming that this is the rational price for the buyback, i.e., the price that will leave investors indifferent between selling their shares back and holding on to the shares, and the cost of capital after the buyback is 8%, **estimate the cost of capital before the buyback.** (You can assume no growth in savings from the change in your cost of capital) (3 points)

7. You are intrigued by the ex-dividend day price behavior of stocks, and what that behavior tells you about the tax status of investors in the company. You have broken dividend-paying companies into the largest and smallest market cap companies, and collected the following information:

| | Largest | Smallest |
|------------------------------|---------|----------|
| Average Price Drop per share | \$1.80 | \$0.60 |
| Average Dividend per share | \$2.00 | \$0.75 |

The capital gains tax rate is 20% for all investors, and dividends are taxed at the ordinary tax rate, but investors who earn less than \$50,000 in income are exempt from paying taxes on dividends. If 30% of the investors in the largest companies earn less than \$50,000, **estimate the percentage of investors in the smallest companies that earn less than \$50,000.** (4 points)

8. You are trying to assess dividend policy and cash accumulation at Linwood Inc, and have collected the following information:

| | Most recent year | 1 | 2 |
|----------------------------|------------------|------------|------------|
| Revenues (in \$ millions) | \$1,000.00 | \$1,200.00 | \$1,500.00 |
| Net margin | 5.00% | 7.50% | 10.00% |
| Depreciation (in millions) | \$40.00 | \$50.00 | \$60.00 |
| Payout Ratio | 20.00% | 40.00% | 60.00% |

You expect capital expenditures to be 120% of depreciation and non-cash working capital to remain at 5% of revenues (the current level) for the next two years. If the cash balance at the end of the most recent year is \$33 million (after the payment of dividends that year), **estimate the expected cash balance at the end of year 2.** (4 points)

9. Roebuck Inc. is a mature firm, which expects to generate \$240 million in after-tax operating income, with depreciation of \$90 million and capital expenditures of \$150 million, next year; there is no working capital need. The company currently has book value of equity in \$1800 million, debt (book and market) of \$900 million and a cash balance of \$300 million. You can assume that the company will maintain its current return on capital and reinvestment rate in perpetuity and face a cost of capital of 7.50%. **Estimate the value of equity today.** (4 points)