1) Motel 9 operates a series of budget motels along major interstates. Its current capital structure is 80% equity and 20% perpetual debt. It pays 8% interest on its debt, and the beta of its levered equity is 0.90. Its corporate tax rate is 35%. Investors pay 30% personal tax on debt income and 20% personal tax on equity income. The risk-free rate is 5%, and the expected return on the market is 12%.

a) What is the tax benefit to debt ($T^*$) for Motel 9?

b) Motel 9 is considering adding a series of new motels along Route 66. This project has the same capital structure, risk, and return-on-assets as the existing business. The new motels will generate before-tax cash-flows of $10 million per year in perpetuity. What is Motel 9's WACC? What is the value of the new project? (You can assume capital expenditures at time 0 of $25 million, but the main point is to value the perpetual cash flows from the project.)

c) Suppose that the new motels will instead be financed with $25 million in new perpetual debt. What is the value of the new project? How does it compare to the valuation you obtained in part (b) and why?

2) XYZ Corp. is considering expanding their business. The project under consideration requires a $100 million investment today and is expected to generate perpetual after-corporate tax cashflows of $13 million per year. The beta of the assets associated with the investment is 1.15. The risk-free rate is 6%, the market risk premium is 8.4% and the corporate tax rate is 34%. There are no expected costs of financial distress or personal taxes.

a) Assume that XYZ finances the project with 100% equity. Calculate the NPV of the proposed expansion. Should the expansion be undertaken?

b) Suppose that instead of financing the project with 100% equity, XYZ finances the expansion with $100 million of perpetual debt. Based on the value of XYZ's existing assets, the debt is risk-free. However, lenders cannot assess the value of XYZ's existing assets and therefore demand a 7% expected return on the debt.

i. What is the NPV of the tax shield associated with the debt issue?

ii. What is the NPV of the debt issue?

c) Based on your answers to parts A and B, calculate the APV of the project. What actions would you recommend that XYZ take? (Should they invest in the project? Should they issue debt?)
3) You are the CEO of ZZ Best carpet cleaners. Initially your firm has 10,000 shares of stock outstanding and the stock price is $100 per share. There is no debt. The “market value” balance sheet of ZZ Best is shown below.

<table>
<thead>
<tr>
<th>Market Value Balance Sheet</th>
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<tbody>
<tr>
<td>Assets</td>
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<tr>
<td>Equity</td>
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Now suppose that you discover a perpetual investment opportunity that requires an investment of $110,000 at the beginning of each year and produces positive (after-corporate tax) cash flows of $210,000 at the end of each year (the balance sheet given above does not include this investment opportunity). The risk of the cashflows from this project is the same as the risk of cashflows from ZZ Best’s assets-in-place. The risk-free rate is 4%, the asset beta is 1.0, the market risk premium is 8.4%, and the corporate tax rate is 34%.

a) You have decided to raise the $110,000 required for the first year’s investment by issuing equity. All potential purchasers of your common stock have full information--they know with 100% accuracy the value of assets-in-place as well as the value and costs of the project. How many shares of stock must be issued to raise the $110,000? At what price should the shares be sold?

b) Now suppose that potential investors are not completely informed about the value of assets in place but they are fully aware of the project’s value and costs. Would you expect the number of shares required to raise $110,000 to increase or decrease? How about the price at which the shares are sold? Explain.

c) Instead of issuing common stock, you decide to issue $610,000 of perpetual debt that has a promised yield of 10% and a beta of 0.2. Of the $610,000, $110,000 will be invested in the positive NPV project and $500,000 will be invested in government bonds. By increasing the firm’s debt level, expected costs of financial distress increase from zero to $50,000. Assuming that investors are completely informed about the value of assets in place and the value of the investment project, what do you expect the stock price to be after the announcement that debt will be issued? (There are no personal taxes.) Hint: write out the balance sheet after the debt issue, being careful to include all of the asset changes to occur as a result of the debt issue.

d) Calculate ZZ Best’s weighted average cost of capital after it issues the debt described in part (c).
Case: Valuation of Boeing

In this assignment, use an adjusted present value approach to value the shares of Boeing. Remember that the goal is to see the sensitivity of the estimated price to various assumptions, not to hit the current price exactly. (For purposes of comparison, assume that the price is as given by Value Line.) You are also asked to estimate the cost of capital and to value Boeing under alternative financing strategies.

Compute your valuation as of the beginning of fiscal year 2003; that is, the cash flow for 2003 will be the cash flow for year one, and do the valuation as of time zero. The valuation will use 10 years of forecasted cash flows, 2003-2012, and an estimate of the residual value after 10 years. Use the Value Line forecasts and historical data to establish your own estimates of

1. Sales growth
2. Profit Margin (note: Value Line's "operating margin" does not include depreciation charges)
3. Annual Depreciation
4. Capital Expenditures
5. Working Capital Required.

To make your forecasts internally consistent, assume that Boeing must maintain a level of gross fixed assets (i.e. before deduction of accumulated depreciation) of 38% of revenues. Also assume that these assets are depreciated over an average useful life of 15 years, with no salvage value. Working capital can be assumed to be some proportion of sales. In the terminal period, assume that capital expenditure equals depreciation and that there is no new investment in working capital.

Use the CAPM to estimate the return on Boeing’s equity. The levered $\beta$ of the company’s equity is given by Value Line. You'll need to unlever this $\beta$. Calculate Boeing's current D/V and E/V ratio by using the "Total Debt" value given as of 9/30/02 and the data on the share price and number of shares outstanding. You can estimate the required return (and $\beta$) of debt by looking at Boeing's current interest costs. Then calculate the unlevered cost of equity using the unlevered $\beta$ plugged into the CAPM. Assume that the market risk premium is 6.0%. The riskless rate is 4.0%. The corporate tax rate is 35%. Ignore personal taxes. (Hint: when calculating the cost of capital, don't forget the tax adjustment arising from corporate tax deductibility of interest payments!)

I. To estimate the value of a share, proceed as follows:

   (a) Forecast cash flows for the ten years, where cash flow equals 
   (sales - operating costs - depreciation)(1 - tax rate) + depreciation - capital expenditures - changes in working capital. Do the forecast for
each input into this equation. Ignore the "cash flow" per share number provided by Value Line.

(b) Find the residual value, i.e. the value of the cash flows beyond 12/31/2012. Assume that after the ten-year planning horizon, the cash flows will grow at an annual rate of 3%.

(c) Discount the cash flows.

(d) Don’t forget to value the tax shields.

Compute the percentage difference between the estimated share value and the actual market price.

II. Now go back and change one assumption at a time, and examine its effect on the estimated share value. Change the growth rate of sales, the operating profit margin, the growth rate of cash flows (after 12/31/2012) and the cost of capital, each by one percentage point. Do not change all assumptions together! One at a time! Which of the parameters has the greatest influence on the estimated share value?

III. With the original assumptions, what is the annual growth rate after 12/31/2012 at which the estimated share value equals the market price (use the “recent price” from Value Line as your benchmark)? With the original assumptions, what is the cost of capital at which the estimated share value equals the market price?

IV. British Airways is looking to upgrade its fleet and gives Boeing a firm order for a new series of aircraft starting next year and ending in 2009. The order replaces other contracts by which airlines had options but no obligation to purchase aircraft. Ignore the possibility that this might increase expected cash flows. Management considers that such a confirmed order reduces the probability of financial distress substantially, and therefore proposes an increase in the debt ratio. The proposal is to take on an additional $5 billion (face value) of debt. Boeing estimates that the required return on this debt will be 6%, and it plans to issue 10 year, 6% coupon bonds. The money raised will be used to buy back equity. Value the firm under these parameters. What effect does this have on Boeing's share price? (Don't forget the debt component of liabilities in this calculation!)

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