Session 21: Post Class tests

1. In the adjusted present value approach (APV), you value the firm without debt (unlevered firm value) and then bring in the effects of debt by considering the value of the tax benefits of debt and the expected bankruptcy costs. In practice, faced with difficulties when estimating expected bankruptcy cost, analysts choose to ignore it and consider only the tax benefit component of debt. If you consider only the tax benefits in your APV assessment, which of the following will you find to be your optimal debt ratio?
   a. No debt
   b. 100% debt
   c. Debt will have no effect on value
   d. Any of the above

2. Vaughn Enterprises is an all-equity funded firm with 100 million shares outstanding, trading at $10/share. The company is planning on borrowing $400 million and buying back shares. The marginal tax rate for the firm is 40% and the cost of bankruptcy as a percent of unlevered firm value is 30%. If the new market capitalization for the firm will be $700 million, after the buyback, what is the probability of bankruptcy after the buyback? (Use the standard APV assumption about the tax benefits of debt)
   a. 0%
   b. 10%
   c. 18.18%
   d. 20%
   e. 28.57%
   f. None of the above

3. Lizzie Inc. is an apparel manufacturer with 200 million shares outstanding, trading at $15/share and $1.2 billion in debt outstanding (in market value terms). If the marginal tax rate for the firm is 40%, the cost of bankruptcy is 20% of current firm value and the probability of bankruptcy at the current debt level is 25%, what is the unlevered value of the firm?
   a. $2,670 million
   b. $3,930 million
   c. $4,200 million
   d. $4,470 million
   e. None of the above

4. Sizzle Media is a media company that has a market capitalization of $900 million and debt outstanding of $100 million. The average debt ratio for media companies is 37%. Which of the following provides a likely explanation for why Sizzle Media should have a lower debt ratio than the average media company?
   a. Sizzle Media has a higher effective tax rate than the typical media company
   b. There are fewer insider investors in Sizzle Media than in the typical media company
   c. Sizzle Media has more stable income than the typical media company
   d. Sizzle Media is a larger company than the typical media company
e. Sizzle Media is more dependent on movie making and has fewer physical assets than the typical media company
f. None of the above
g. All of the above

5. You have run a regression of debt to capital ratios against independent variables, across all companies in the market, and arrived at the following:
   Debt to Capital Ratio = 0.40 + 0.25(Effective Tax Rate) – 0.15 (Insider holdings as % of shares outstanding) – 0.20 (Standard deviation in operating earnings)
   Felter Inc. has an effective tax rate of 30%, insider holdings are 10% of outstanding shares and you have estimated a standard deviation of 50% in the firm’s operating earnings. What is the optimal debt ratio for Felter Inc., based upon the market regression? (Enter the percentage values as decimals; thus, 20% is entered as 0.20)
   a. 36%
   b. 39%
   c. 40%
   d. 56%
   e. None of the above
Session 20: Post class test solutions

1. **b. 100% debt.** Since you are counting in the benefits of debt and are assuming no costs, debt can only increase value (The only exception is if you have a zero tax rate, in which case it will have no effect on value).

2. **d. 20%.** Set up the equation for the value of the levered firm

   Value of levered firm = Value of unlevered firm + Debt * Tax Rate – Probability of bankruptcy * Cost of bankruptcy

   700 + 400 = 100*10 + 400*.4 – Probability of bankruptcy (.3)(1000)

   Probability of bankruptcy = 60/300 = 20%

3. **b. $3,930 million.** The unlevered firm value can be obtained from the firm value by subtracting out the tax benefits of debt and adding back the expected bankruptcy costs (you will lose both when you have no debt)

   Value of levered firm = 3000 +1200

   Tax benefit = 1200*.4

   Expected cost of bankruptcy = .25*.20*4200 = $210

   Value of unlevered firm = 4200 – 480 + 210 = $3,930 million

4. **e. Sizzle Media is more dependent on movie making and has fewer physical assets than the typical media company.** The fact that the firm has less in physical assets increases agency costs associated with borrowing and thus will lead Sizzle Media to have less debt.

5. **a. 36%.** Plugging into the market regression:

   **Optimal debt ratio** = 0.4+0.25*0.3-0.15*0.1 - 0.2*0.5 = 0.36