Session 17: Post Class tests

1. Assume that the legislators are looking at enacting a new tax law, aimed at getting companies to pay out more of their earnings as dividends. As part of this law, companies will pay two different tax rates on net income: a 35% tax rate on retained earnings and a 15% tax rate on earnings paid out as dividends. What effect will this have on corporate financing behavior?
   a. None. Debt ratio should remain unchanged
   b. Debt ratios should go up over time, as companies pay more dividends
   c. Debt ratios should go down over time.

2. Asker Inc. is an all-equity funded firm that is considering borrowing $1 billion at a market interest rate of 6%. If the loan is a balloon payment loan for 10 years (only interest paid for the next 10 years and the principal at the end of year 10) and Asker faces a 40% marginal tax rate, what is the value of the tax benefits that Asker will get just from the ten-year loan?
   a. $24 million
   b. $176.64 million
   c. $240.00 million
   d. $264.96 million
   e. $1 billion

3. The argument for debt as a mechanism to discipline management is built around the premise that stockholders generally have little power over managers. If this argument holds true, a company that borrows more money should
   a. Invest more in good projects after the borrowing
   b. Invest less in good projects after the borrowing
   c. Invest more in bad projects after the borrowing
   d. Invest less in bad projects after the borrowing
   e. None of the above

4. A cost that has to be weighed into the debt decision is the expected cost of bankruptcy. As that cost rises, companies should borrow less money. Assume that you are looking at a European power company that has historically enjoyed monopoly power and has funded itself with a significant amount of debt. The power market has now been opened up to competition. What change would you expect to see in the company's debt policy?
   a. None. It is still a profitable company
   b. Debt ratio should go up.
   c. Debt ratio should go down.

   Explain.

5. Agency costs arise any time there is a conflict between stockholder interests and lender interests. Assuming that agency costs are high at a company, relative to the rest of the market, which of the following would you expect to observe with the company's borrowing?
   a. It will be able to borrow less than other companies
b. It will have to pay higher interest rates on its loans than otherwise similar companies
c. It will face more "covenants” than otherwise similar companies
d. All of the above
e. None of the above

6. The Miller Modigliani theorem posits that debt policy is irrelevant, when it comes to firm value. Assume that you have a firm that is funded entirely with equity and has a beta (unlevered) of 0.90; the risk free rate is 3% and the equity risk premium is 6%. What will happen to the cost of capital, if the firm moves to a 30% debt ratio? (Remember that there are no taxes or default risk in the Miller Modigliani world).
   a. The cost of capital will remain unchanged
   b. The cost of capital will go up
   c. The cost of capital will go down
   Can you provide proof?

7. In a world with no taxes, default risk or agency costs, Miller and Modigliani argue that your debt ratio is irrelevant and that your firm value will remain unchanged as the debt ratio changes. Assume now that you introduce tax benefits for debt and that you expose them to default, what would you expect the right mix of debt and equity to be for a firm which is fully protected against bankruptcy?
   a. Debt would still be irrelevant.
   b. The firm should be all equity funded
   c. The firm should be all debt funded.
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1. **c. Debt ratios should go down over time.** The lower tax rate on dividends effectively lowers the cost of equity. Since the after-tax cost of debt does not change, this will make debt a less attractive choice to all companies and even more so for mature companies that can afford to pay high dividends.

2. **b. $176.64 million.** The interest tax savings each year can be computed by multiplying the interest expense by the marginal tax rate:

   \[
   \text{Interest tax savings} = 60 \times 0.4 = \$24 \text{ million}
   \]

   Taking the present value of these savings over 10 years at the pre-tax cost of debt (assumed to measure the risk in the tax savings as well), you get:

   \[
   \text{PV of savings} = \$24 \text{ m (PV of annuity, 10 years, 6\%) = $176.64 m}
   \]

3. **d. Invest less in bad projects after the borrowing.** The idea behind using debt as a disciplinary mechanism is more to prevent taking bad projects than to induce taking good projects.

   In fact, borrowing more money may sometimes cause companies to invest less in good projects (making choice b a viable one) especially if these good projects are in risky businesses.

4. **c. Debt ratio should go down.** As competition heats up, the profits of the hitherto monopoly company will become more volatile. In expected bankruptcy terms, the probability of default has gone up at every level of debt making the expected costs of bankruptcy higher.

5. **d. All of the above.** When agency costs go up, it is the borrower who bears the brunt of the cost and it takes all forms. Lenders will lend less money, charge higher interest rates and write in more covenants, if they are concerned about where their money is going.

6. **c. The cost of capital will remain unchanged.** To prove it, start with the cost of capital at a zero debt ratio. With the unlevered beta of 0.90:

   - Cost of equity = Cost of capital = 3\% + 0.9\% 6\% = 8.4\%
   - If the firm moves to any debt to capital ratio (say 20\%), it will be borrowing at the risk free rate of 3\% (since there is no default risk) and the levered beta will rise

     \[
     \text{Levered beta} = 0.90 \times (1 + (1-0) \times (20/80)) = 1.125
     \]

     \[
     \text{Cost of equity} = 3\% + 1.125 \times (6\%) = 9.75\%
     \]

     \[
     \text{Cost of capital} = 9.75\% \times (0.8) + 3\% \times (0.2) = 8.4\%
     \]

7. **c. The firm should be all debt funded.** If you give debt the tax benefits and not offset it with expected bankruptcy costs, firms should be predominantly debt funded.