Session 9: Post Class tests

1. A key input into your terminal value is the expected growth rate in perpetuity. Assuming that you are valuing a company in a currency with a risk free rate of 3%. Which of the following growth rates is not feasible?
    a. -3% in perpetuity
    b. 0% in perpetuity
    c. 2% in perpetuity
    d. 4% in perpetuity
    e. None of the above
2. Avalon Inc. is a high growth publicly traded firm that is expected to become a stable growth firm after 5 years. You have estimated an expected after-tax operating income of $60 million in year 6 and believe that the firm will generate a return on capital of 12% in perpetuity. If the cost of capital is 10% and the expected growth rate in perpetuity after year 5 is 3%, what will the terminal value be at the end of year 5?
    a. $857.14 million
    b. $666.67 million
    c. $642.86 million
    d. $450 million
    e. None of the above
3. Wayfarers Inc. is a risky technology company that is expected to have a cost of capital of 12% for the next 10 years. At the end of year 10, it is anticipated that the firm will become a mature company, earning a return on invested capital equal to its stable period cost of capital of 10% in perpetuity. If the expected after-tax operating income in year 11 is $80 million and the expected growth rate in perpetuity is 3%, estimate the present value of the terminal value at the end of year 10.
    a. $257.58 million
    b. $308.43 million
    c. $367.97 million
    d. $440.62 million
    e. None of the above
4. It is true that in a discounted cash flow valuation, the terminal value accounts for a large proportion (60% or more) of the value. It follows that the assumptions you make about terminal value are the most critical determinants of value.
    a. True
    b. False
5. You are using a dividend discount model to value a bank, which is expected to generate a 15% return on equity in perpetuity. The company paid dividends of $40 million on net income of $100 million in the most recent year and is expected to maintain high growth for the next 3 years, before settling into stable growth, growing 3% a year in perpetuity. If the cost of equity is 9%, estimate the terminal value at the end of year 3.
    a. $889.25 million
    b. $1778.51 million

c. $2223.13 million
d. $741.04 million
e. None of the above

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1. **d. 4% in perpetuity.** Using a growth rate that exceeds the risk free rate is dangerous, since the risk free rate operates as a proxy for nominal growth in the economy.
2. **c. $642.86 million.** To compute the terminal value after year, you first have to estimate a reinvestment rate:
    - Reinvestment rate = 3%/12% = 25%
    - FCFF in year 6 = 60 (1-.25)/ (.10-.03) = $642.86 million
3. **a. $257.58 million.** The first step is to estimate the terminal value at the end of year 10
    - Reinvestment Rate = g/ ROC = 3%/10% - 30%
    - Terminal value = 80 (1-.30)/(.10-.03) = $800 million
    - PV of terminal value = $800/$1.12^{10}$ = $257.58 million
4. **b. False.** The terminal value is determined in large part by your assumptions about growth during the high growth period. The cash flow you have in your terminal value equation will be much higher, if you use higher growth during the growth period and thus the terminal value will be significantly impacted by what you assume will happen during high growth.
5. **b. $1778.51 million.** To get the terminal value, you have to first estimate the earnings in year 4, followed by the payout ratio in year 4:
    - Expected growth rate for next 3 years = .6*.15 = .09 or 9%
    - Net Income in year 4 = 100 $(1.09^3)(1.03)$ = $133.39 million
    - Payout ratio in year 4 = g/ ROE = 3%/15% = 20%
    - Terminal value in year 3 = 133.39 (1-.20)/(.09-.03) = $1778.51 m