

## Session 12: Post class test solutions

1. The fully diluted approach adjusts just the number of shares and does not count the exercise proceeds, and thus will undervalue equity. The treasury stock approach counts the exercise proceeds, but ignores the time value of the option. It will therefore over value equity.
  - Fully diluted value/share =  $500 / (100+25) = \$4/\text{share}$
  - Treasury stock approach =  $(500+25*\$5) / (100+25) = \$5/\text{share}$
2. **b. \$4.75.** To compute the value per share, you first net out the option value of the employee options from the DCF value of equity, and then divide by the actual number of shares outstanding.
  - Value per share =  $(500 - 25*\$1) / 100 = \$4.75/\text{share}$
3. **e. \$1.675 billion.** In this case, we are starting with the market value of the traded shares (rather than the DCF value of all equity). Consequently, if there are options outstanding, they will depress the stock price. To get to the total value of equity, you should add the option value of outstanding options.
  - Value of equity =  $(200*\$8) + (10*7.50) = \$1,675 \text{ million}$
4. **a. Dividends = FCFE, Beta = 0.90, Payout ratio = 80%.** For a stable growth dividend discount model to work, you have to have the following combination: a growth rate lower than that of the economy, dividends roughly equal to FCF, a beta close to one and a high payout ratio (reflecting mature status).
5. **d. Expected growth next 5 years = 9.6%, Payout ratio after year 5 = 75%.** To get the expected growth rate for the high growth period, you multiply the return on equity by the retention ratio (= 1 - payout ratio):
  - Expected growth rate =  $12\% * (1-.20) = 9.6\%$
  - To get the payout ratio in perpetuity, you use the same equation, with the expected growth rate set equal to the growth rate in perpetuity and solve for the payout ratio:
    - $3\% = 12\% (1 - \text{Payout ratio})$
    - Payout ratio =  $1 - 3\%/12\% = 75\%$
6. **a. 8%.** To solve for the imputed return on equity, set the value equation up, using a stable growth dividend discount model:
  - Price per share =  $\$18.75 = \$2.00 (1 - .02 / \text{ROE}) / (.10 - .02)$
  - Imputed ROE = 8%