

### Quiz 3: Equity Instruments

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You are considering whether you should buck the prevailing trend and invest in banks, partly because the median price to book ratio (across banks) has dropped to 1.20, which you believe is a bargain.

a. Assuming that banks collectively are in stable growth, growing 3% a year and that the cost of equity for banks is 8%, estimate the return on equity that you would need to make in the long term to justify a price to book ratio of 1.20. (2 points)

b. Now assume that banks collectively reported a return on equity of 15% in the most recent year. Looking forward, you are concerned about two issues:

- You believe that the earnings last year were high because times were good and that the earnings next year will drop by 20% (to what you believe are normal levels).
- You also believe that the regulatory authorities will raise bank capital ratios soon, requiring firms to add 20% to their book equity.

Given these estimates, would you still invest in banks? (1 point)

2. You are reviewing the valuation of Siventa, a luxury handbag manufacturer and note that the firm is in stable growth (growing 3% a year), is expected to earn an after-tax operating margin of 15% and have a sales/ book capital ratio of 1.2 next year, and is trading at 2.5 times trailing revenues of \$ 1 billion. ( $EV/Sales = 2.5$ ).

a. Assuming that the market has priced Siventa correctly, estimate the cost of capital for the firm. (2 points)

b. Generic manufacturers of handbags are not publicly traded but they do earn a much lower after-tax operating margin (6%) and report roughly the same sales/book capital ratio as Siventa. Estimate the value of Siventa's brand name. (2 points)

3. The following multiple choice questions relate to the valuation of private businesses.  
a. The total beta of a firm captures all risk it is exposed to and not just the risk that is non-diversifiable. In which of the following scenarios would you be on the firmest ground in using total betas?

- i. Valuing the business for sale to a publicly traded company
- ii. Valuing the business for an initial public offering
- iii. Valuing the business for sale to an individual who will be fully invested in that business
- iv. Valuing the business for sale to a private equity investor, with multiple holdings.
- v. None of the above.

b. When estimating the cost of capital for a private business, we are hampered by the absence of market values for debt and equity. Which of the following is not an acceptable solution to this problem?

- i. Using the average market debt ratio for publicly traded firms in the business
- ii. Using a target or optimal debt ratio specified by management
- iii. Using a book value debt ratio for the private company
- iv. Using the estimated values of debt and equity from the valuation (and iterating)

c. You are valuing a private firm that is a money-losing firm with revenues of \$ 20 million and are trying to compute a reasonable illiquidity discount, using a bid-ask spread regression run across publicly traded stocks:

$\text{Spread/Stock price} = 0.275 + 0.05 (\text{Earnings Dummy}) - 0.06 \ln (\text{Annual Revenues}) - 0.02 (\text{Trading volume})$

Earnings dummy = 0 if firm is making money; 1 if losing money. Revenues and trading volume are in millions. Estimate the illiquidity discount. (1 point)

d. You are valuing a private firm and plan to apply a multiple of 12 times to net income (based upon comparable firms) to arrive at an equity value. The firm is reporting a net income of \$ 300,000 but the firm's owner, who has been involved intensely in running the business, does not collect a salary and you believe that you will have to pay a professional manager \$ 100,000 a year to fulfill these duties. If the tax rate for the firm is 40%, estimate the equity value for this firm. (1 point)