

## Chapter 17

17-1

- a. The cost of internal equity =  $6.5 + 1.2(6) = 14.3\%$
- b. The cost of external equity =  $(100/95)(14.3) = 15.0526\%$

17-2

- a. If the current owners give up 30% of the firm, they will be left with  $(0.7)(120) = \$84\text{m}$ . Otherwise, they have  $\$80\text{m}$ . Hence, they are better off taking the venture capital, assuming that they cannot do better.
- b. The breakeven percentage would be  $x$ , where  $x$  solves  $120x = 80$ , or  $x = 2/3$ ; i.e. the owners should be willing to give up no more than 33% of the firm.

17-3

We assume that Office Helpers is choosing to go public instead of using venture capital. Furthermore, we assume that the market valuation of  $\$120$  will hold even with the IPO. Finally, let us assume that  $\$20$  million need to be raised. Now, if the target price is  $\$10$ , which represents an underpricing of 20%, the true value of the shares would be  $10/.8 = \$12.5$  per share. At this price, the firm would have to issue  $20/10$  or 2 million shares. Since the 2 million shares will represent a value of  $\$25$  million, the total number of shares outstanding would be  $2(120/25) = 9.6$  million shares. Of this, the existing shareholders would get 7.6 million shares, representing a value of  $(7.6/9.6)120 = \$95\text{m}$ .; the public shareholders would get  $(2/9.6)120 = \$25\text{m}$ . for which they would have paid  $2(10) = \$20\text{m}$ ., or an undervaluation of  $5/25$  or 20%.

17-4

- a. The exit value will be  $50(15) = \$750\text{m}$ .
- b. The discounted terminal value is  $750/1.35^4 = \$225.80\text{m}$ .
- c. You would ask for at least  $75/225.80$  or 33% of the firm.

17-5

- a. The expected return using the CAPM is  $6.5 + 1.1(6) = 13.1\%$
- b. Venture capitalists typically have to invest a large portion of their portfolio in a single firm; hence there is a lot of diversifiable risk that they would have to hold. Furthermore, firms requiring venture capital would normally be riskier than other firms in the industry.

17-6

The loss to the existing shareholders is  $50(\$18) = \$900\text{m}$ . The main people gaining from the underpricing are the investors that are able to buy the stock at the issue price.

17-7

I would agree with this statement. I would test it empirically by looking at the extent of underpricing for firms of different sizes. I would also look at the degree of underpricing of well-known firms that decide to go in for an IPO.

17-8

a. Since you are a small firm, you should consider the reputation of the investment banker. A more reputable investment banker may be able to attract wary investors into the offering. If you are a high technology or biotechnology firm, where technical knowledge may be essential in the valuation process, you should pick an investment banker with some experience with similar issues.

b. If the issue is fairly priced, 40% of the firm (20/50).

c. If the investment banker underprices the issue, you will have to sell

Value of Securities Sold =  $\$20/.9 = \$22.22$

As % of Overall Firm Value =  $22.22/50 = 44.44\%$

d. You would have to sell roughly 2 million shares: ( $\$50 \text{ million}/2 \text{ million} = \$25$ )

17-9

a.

Number of shares you would need to sell in rights offering =  $\$100 \text{ mil}/\$25 = 4 \text{ million}$

Number of shares outstanding = 10 million

You would need 5 rights to buy two shares.

b. Ex-rights price =  $(50*10+25*4)/14 = \$42.86$

c. Value per right = Pre-rights price - Ex-rights price =  $\$50 - \$42.86 = \$7.14$

d. If the price of the right were higher than \$7.14, I would sell my rights at the higher price and keep the difference as excess return. The stock price after the rights issue and the cash will yield me more than what I paid for the stock which was \$50.

17-10

a. Expected Stock Price =  $(1 \text{ million} * \$15 + 500,000 * \$10)/1.5 \text{ million} = \$13.33$

b. Price per Right =  $\$15 - \$13.33 = \$1.67$

c. No, because I will own more shares after the issue.

17-11

a. The current capital is  $\$15(1 \text{ million shares}) = \$15 \text{ million}$ . Additional capital to be raised is  $\$10(0.5 \text{ million shares}) = \$5 \text{ million}$ . Hence, net income after the issue will be  $\$1 \text{ million}(20/15) = \$1.33 \text{ million}$ . Hence EPS would be  $1.33/1.5 = 88.67 \text{ cents per share}$ .

b. Earnings per share under this alternate scenario would be  $1.33/1.33 = \$1 \text{ per share}$

c. No, if I have availed myself of the rights issue; in this case, I would have the same proportional ownership of the firm. Even if I had sold the right, I would have been compensated for the lost value.