

Question 21.

American-style options give you the benefits of upside price movements without the downside of downward price movements and so you should generally try to hold onto them to maximise your gains.

Question 22.

$$\text{initial angel ownership} = \frac{\$200K}{\$1M} = 20\%$$

$$\text{post venture capital angel ownership} = \frac{65M}{80M} \times 20\% \\ = 16.25\%$$

$$\$80M \times 16.25\% = \$13M$$

$$\text{return} = \frac{13M - 200K}{200K} = 6400\% \text{ or } 64\times$$

Question 23.

The market feedback hypothesis proposes that issuers are uncertain of the true value of their firm and thus try to discover the true value via an initial book-building process involving the market. However, IPOs are underpriced as the market feedback hypothesis states that this is necessary to induce institutional investors to reveal the true value of the firm.

Question 24.

Cost = \$180,000, 8 years

SV = \$15,250

$t_c = 0.30$

after-tax cost of borrowing = $0.1 \times (1 - 0.3) = 0.07$

Lease payment tax shield = $LP \times 0.3$

Depreciation tax shield = $0.3 \times \left(\frac{180,000}{8} \right) = 6750$

Tax on gain from sale = $(\$15,250 - 0) \times 0.3 = +4575$

$NPV_{\text{lease}} = 0$

$$\begin{aligned} & \frac{\$180,000 - LP + 0.3LP}{1.07} + \frac{0.3LP - LP - 6750}{1.07} \\ & + \frac{0.3LP}{1.07^2} + \frac{0.3LP}{1.07^3} + \frac{0.3LP}{1.07^4} + \frac{0.3LP}{1.07^5} \\ & + \frac{0.3LP}{1.07^6} + \frac{0.3LP}{1.07^7} + \frac{4575 - 15250 - 6750}{1.07^8} \end{aligned}$$

Solve for LP:

$LP = \$29844.80$

Question 25.

5M S/O \$18 = \$90M market cap

Raise \$1M via 100k shares at \$10 each

now \$91M market cap with 5.1M shares

$$\frac{91}{5.1} = 17.8431$$

financial institution gain = existing shareholder loss

$$= 90M - 5M \times 17.8431 = 0.7845M$$

$$= \$784,500$$

Question 26.

If lenders believe a company is likely to go bankrupt then these lenders will charge higher interest rates to cover potential bankruptcy costs. These higher interest rates are 'paid' for by the shareholders in the form of more expensive debt which means less money available for shareholders.

Question 27.

$$D = \$2,000,000$$

$$E = \$3,000,000$$

$$r_D = 0.08$$

$$r_E = 0.15$$

$$t_c = 0.30$$

$$WACC = r_D(1 - t_c) \frac{D}{D+E} + r_E \frac{E}{D+E}$$

$$= 0.08 \times 0.7 \times \frac{2M}{5M} + 0.15 \times \frac{3M}{5M}$$

$$= 0.1124 = 11.24\%$$

Question 28.

$$P_{\text{Cum}} = \$15$$

$$t_{\text{cg}} = 0.1$$

$$\text{Div} = \$2$$

$$t_d = 0.2$$

$$\frac{P_{\text{Cum}} - P_{\text{Ex}}}{\text{Div}} = \frac{1 - t_d}{1 - t_{\text{cg}}}$$

$$\frac{15 - P_{\text{Ex}}}{2} = \frac{0.8}{0.9}$$

$$15 - P_{\text{Ex}} = \cancel{10} \frac{16}{9}$$

$$P_{\text{Ex}} = 15 - \frac{16}{9} = \$13.22$$

Question 29.

initial investment = \$500k

b = number of bikes sold

$$NPV = -500,000 + \frac{50 \times b}{0.1} \left(1 - \frac{1}{1.15}\right) + \frac{200,000}{1.15}$$

$NPV = 0$, solve for b

$$\frac{50b}{0.1} \left(1 - \frac{1}{1.15}\right) = 500,000 - \frac{200,000}{1.15}$$

$$b = \frac{0.1 \left(500,000 - \frac{200,000}{1.15}\right)}{50 \left(1 - \frac{1}{1.15}\right)}$$

$$b = 1982.78$$

$$\approx 1982$$

the number of bicycles sold needs to fall to 1982 or by 5018 or by $\approx 71.69\%$

Question 30.

old IRR = 19.7%

new IRR = 21.2%

1.5% improvement

IRR	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
					37.1%	30.0%	27.2%	24.4%	21.2%	19.1%	17.5%	16.3%	15.3%	14.5%		

Exit Year
IRR

2017
21.2%

IRR - Assuming Exit in 2017E

Entry Multiple	Exit Multiple					
	21.2%	7.0x	7.5x	8.0x	8.5x	9.0x
7.0x		26.7%	29.2%	31.5%	33.6%	35.6%
7.5x		21.2%	23.5%	25.7%	27.8%	29.7%
8.0x		16.8%	19.1%	21.2%	23.2%	25.1%
8.5x		13.3%	15.5%	17.5%	19.5%	21.3%
9.0x		10.3%	12.4%	14.4%	16.3%	18.1%

IRR - Assuming 8.0x Entry Multiple

Exit Multiple	Exit Year					
	21.2%	2015	2016	2017	2018	2019
7.0x		18.0%	18.4%	16.8%	15.7%	14.8%
7.5x		22.8%	21.5%	19.1%	17.4%	16.2%
8.0x		27.2%	24.4%	21.2%	19.1%	17.5%
8.5x		31.3%	27.1%	23.2%	20.6%	18.8%
9.0x		35.2%	29.6%	25.1%	22.1%	19.9%