Chapter 6
Common Stock Valuation

Concept Questions

1. The basic principle is that we can value a share of stock by computing the present value of all future dividends.

2. P/E ratios measure the price of a share of stock relative to current earnings. All else the same, future earnings will be larger for a growth stock than a value stock, so investors will pay more relative to today’s earnings.

3. The earnings yield is earnings per share divided by price per share, i.e. the reciprocal of the P/E ratio.

4. It is computed by taking net income plus depreciation and then dividing by the number of shares outstanding.

5. The value of any investment depends on its cash flows; i.e., what investors will actually receive. The cash flows from a share of stock are the dividends.

6. Investors believe the company will eventually start paying dividends (or be sold to another company).

7. In general, companies that need the cash will often forgo dividends since dividends are a cash expense. Young, growing companies with profitable investment opportunities are one example; another example is a company in financial distress.

8. The general method for valuing a share of stock is to find the present value of all expected future dividends. The constant perpetual growth model presented in the text is only valid (i) if dividends are expected to occur forever, that is, the stock provides dividends in perpetuity, and (ii) if a constant growth rate of dividends occurs forever. A violation of the first assumption might be a company that is expected to cease operations and dissolve itself some finite number of years from now. The stock of such a company would be valued by the methods of this chapter by applying the general method of valuation. A violation of the second assumption might be a start-up firm that isn’t currently paying any dividends, but is expected to eventually start making dividend payments some number of years from now. This stock would also be valued by the general dividend valuation method of this chapter.

9. The two components are the dividend yield and the capital gains yield. For most companies, the capital gains yield is larger. This is easy to see for companies that pay no dividends. For companies that do pay dividends, the dividend yields are rarely over five percent and are often much less.

10. Yes. If the dividend grows at a steady rate, so does the stock price. In other words, the dividend growth rate and the capital gains yield are the same.

Core Questions

1. \[ V(0) = \frac{4}{1.11} + \frac{4}{(1.11)^2} + \frac{4}{(1.11)^3} + \frac{4}{(1 + .11)^4} + \frac{40}{(1.11)^4} = 38.76 \]
2.  
\[
V(0) = \frac{4.00}{1.11} + \frac{4.00}{(1.11)^2} + \frac{4.00}{(1.11)^3} + \frac{4.00}{(1 + .11)^4} + \frac{LD}{(1.11)^3} = 50.00 \\
LD = 37.59 = LD/(1 + .11)^4 
\]

3.  
\[
V(0) = \left[\frac{3(1.06)}{(1.12 - .06)}\right][1 - (1.06/1.12)^3] = 12.75 \\
V(0) = \left[\frac{3(1.06)}{(1.12 - .06)}\right][1 - (1.06/1.12)^10] = 22.44 \\
V(0) = \left[\frac{3(1.06)}{(1.12 - .06)}\right][1 - (1.06/1.12)^{100}] = 52.78 
\]

4.  
\[
V(0) = \frac{30}{(108/1.08)}[1 - (108/1.18)^{10}] ; D = 4.35 
\]

5.  
\[
V(0) = \left[\frac{3.50(1.20)}{(1.12 - .12)}\right][1 - (1.12/1.11)^{25}] = 281.02 \\
V(0) = \left[\frac{3.50(1.12)}{(1.12 - .12)}\right][1 - (1.12/1.11)^{25}] = 98.53 \\
V(0) = \left[\frac{3.50(1.06)}{(1.12 - .06)}\right][1 - (1.06/1.12)^{25}] = 50.76 \\
V(0) = \left[\frac{3.50(0.95)}{(1.11 + .05)}\right][1 - (0.95/1.11)^{25}] = 20.36 
\]

6.  
\[
V(0) = \left[\frac{3.00(1.055)}{(1.180 - .055)}\right][1 - (1.08/1.16)^{10}] = 50.78 
\]

7.  
\[
V(0) = \frac{80}{4.10/(k - .04)} , k = .04 + 4.10/80 = 9.125\% 
\]

8.  
\[
V(0) = \frac{30}{(1.90 + .07)} ; g = 6.60\% 
\]

9.  
\[
V(0) = \frac{80}{D(1)/(.09 - .05)} ; D(1) = 3.20 \\
D(3) = 3.20(1.05)^2 = 3.53 
\]

10.  
Retirement ratio = 1 - ($3.20/$8.60) = .6279 
Sustainable growth rate = .20(.6279) = 12.56\%

11.  
Sustainable growth = .06 = .19r ; retention ratio = .3158 
Payout ratio = 1 - .3158 = .6842 = D/EPS = $2.20/EPS ; EPS = 2.20/.6842 = $3.22 
P/E = 21, EPS = $3.22, so V(0) = $3.22(21) = $67.52

Intermediate Questions

12.  
\[
V(0) = \left[\frac{2.16(1.25)}{(1.14 - .25)}\right][1 - (1.25/1.14)^8] + \left[\frac{(1 + .25)(1 + .14)^8}{(1.07)/(.14 - .07)}\right] = 95.73 
\]

13.  
\[
V(0) = \left[\frac{1.34(1.19)}{(1.12 - .19)}\right][1 - (1.19/1.12)^{12}] + \left[\frac{(1 + .19)(1 + .12)^{12}}{(1.06)/(.12 - .06)}\right] = 73.37 
\]

14.  
\[
V(9) = D(10)/(k - g) = 4/(.15 - .08) = 57.14 \\
V(0) = V(9)/(1.15)^9 = 57.14/(1.15)^9 = 16.24 
\]

15.  
\[
D(3) = D(0)(1.3)^3 ; D(4) = D(0)(1.3)^3(1.2) \\
V(4) = D(4)(1 + g)/(k - g) = D(0)(1.3)^3(1.2)(1.06)/(1.14 - .06) = 34.9323D(0) \\
V(0) = 56.20 = D(0){ (1.3/1.14) + (1.3/1.14)^2 + (1.3/1.14)^3 + (1.3/1.14)^4 + [1.3^2(1.2) + 34.9323]/1.14^4 } 
\]
D(0) = $56.20/$26.167 = $2.15 ; D(1) = $2.15(1.3) = $2.79
16. \[ V(4) = \frac{2.00(1.07)}{0.15 - 0.07} = 26.75 \]

\[ V(0) = \frac{14.00}{1.15} + \frac{10.00}{1.15^2} + \frac{5.00}{1.15^3} + \frac{(2.00 + 26.75)}{1.15^4} = 39.46 \]

17. \[ V(6) = \frac{D(7)}{k - g} = \frac{3.00(1.065)^7}{0.10 - 0.065} = 133.20 \]

\[ V(3) = \frac{3.00(1.065)^4}{1.15} + \frac{3.00(1.065)^3}{1.15^2} + \frac{3.00(1.065)^2}{1.15^3} + \frac{133.20}{1.15^3} = 96.92 \]

\[ V(0) = \frac{3.00(1.065)^1}{1.20} + \frac{3.00(1.065)^2}{1.20^2} + \frac{3.00(1.065)^3}{1.20^3} + \frac{96.92}{1.20^3} = 63.21 \]

18. P/E ratio: values are 14.90, 17.04, 19.64, 21.00, 19.20; average = 18.64

EPS growth rates: 5.88%, 3.70%, 3.57%, 17.24%, 10.29%; average = 8.14%

Expected share price using P/E = 18.64(3.75)(1.0814) = $75.57

P/CFPS: values are 6.33, 6.39, 7.24, 7.91, 8.68, 8.78; average = 7.56

CFPS growth rates = 20.00%, 5.56%, 1.45%, 1.56%, 4.73%; average = 6.66%

Expected share price using P/CFPS = 8.20(7.56)(1.0666) = $66.08

P/S: values are .717, .800, .928, .942, .986, .972; average = .891

SPS growth rates: 8.49%, 3.04%, 9.28%, 6.56%, 7.32%; average = 6.94%

Expected share price = .891($74.05)(1.0694) = $70.55

A reasonable price range would seem to be $66 to $76 per share.

19. \[ k = 0.05 + 0.90(0.085) = 12.65\% \]

Dividend growth rates: 6.49%, 8.54%, 5.62%, 7.45%, 7.92%; average = 7.20%

\[ V(2004) = \frac{1.09(1.0720)}{(1.1265 - 0.0720)} = 23.00 \]

Notice the last dividend is for 2003. To find the price in 2004, we must use the dividend in 2005 in the constant perpetual dividend growth model.

20. P/E ratio: N/A, N/A, N/A, 12,400, 2,833.33, 50.00; average = 5,094.4

EPS growth rates: 54.00%, 65.22%, 106.25%, –40.00%, 300.00%; average = 97.09%

Expected share price using P/E = 5,094.44($0.12)(1.9709) = $1,204.90

P/CFPS: N/A, N/A, N/A, 8,500.00, 60.00; average = 4,280.00

CFPS growth rates: 42.22%, 38.46%, 67.19%, 100.95%, 900.00%; average = 229.76%

Expected share price using P/CFPS = 4,280.00($0.10)(3.2976) = $1,411.39

P/S: values are 5.200, 17.429, 30.000, 40.656, 5.280, 0.374; average = 16.490

SPS growth rates: 40.00%, 14.29%, –4.69%, 5.57%, –0.31%; average = 10.97%

Expected share price using P/S = 16.490($16.05)(1.1097) = $293.70

This price range is huge, from $294 to $1,411! As long as the stellar growth continues, the stock should do well. But any stumble will likely tank the stock. Be careful out there!

21. P/E ratios and P/CFPS are all negative, so these ratios are unusable.

P/S: values are 18.594, 2.857, 1.95; average = 7.22

SPS growth rates = 89.58%, 131.32%; average = 110.45%

Expected share price using SPS = 7.22($21.05)(2.1045) = $319.63

This price is ridiculous, $320! Notice that sales have been exploding, but the company still can’t make money. Might be a buyout candidate, but at what price?
22. Except for two years the P/E ratios and P/CFPS are all negative, so these ratios are unusable. P/S: values are 13.333, 11.130, 4.361, 1.971, 0.753, 0.516; average = 5.344 SPS growth rates: 36.90%, 11.65%, 7.48%, 7.83%, -37.50%; average = 5.27% Expected share price = 5.344($23.25)(1.0527) = $130.80

This stock is a classic bubble, and the price of $131 obtained by price-sales analysis is unrealistic. Profitable for two years before turning south, possibly the company can be rescued. The market price of $12 may be a fair price considering the risks involved.

23. Parador’s expected future stock price is $60 \times 1.15 = $69.00, and expected future earnings per share is $4.50 \times 1.1 = $4.95. Thus, Parador’s expected future P/E ratio is $69.00 / $4.95 = 13.94.

24. Parador’s expected future stock price is $60 \times 1.15 = $69.00, and expected future sales per share is $23 \times 1.12 = $25.76. Thus, Parador’s expected future P/E ratio is $69.00 / $25.76 = 2.679.

25. \[ b = 1 - (\frac{0.84}{1.40}) = 0.40; \quad g = 6.00\% \times 0.40 = 2.40\% \]
\[ k = 1.06\% + 0.80(9\%) = 8.26\% \]
\[ P_0 = \frac{0.84(1 + 0.024)}{0.0826 - 0.0240} = $14.68 \]

26. Average stock price: $30.10, $24.40, $18.15, $20.70, $24.90 P/E ratio: 10.95, 7.85, 6.01, 10.10, 17.79; Average P/E = 10.54 EPS growth rates: 13.09%, -2.89%, -32.12%, -31.71%; Average EPS growth = -13.41% P/E price: 10.54(1 - .1341)($1.40) = $12.77 P/CF ratio: 8.11, 5.48, 4.23, 6.23, 9.61; Average P/CF = 6.74 CF growth rates: 19.95%, -3.60%, -22.61%, -21.99%; Average CF growth rate = -7.06% P/CF price = 6.74(-.0706)($2.59) = $16.21 P/S ratios: 0.343, 0.224, 0.165, 0.189, 0.276; Average P/S = 0.240 SPS growth rates: 23.87%, 0.92%, -0.02%, -17.86%; Average SPS growth rate = 1.73% P/S price = 0.240(.0173)($90.12) = $21.96

27. A fair price seems to be $15 to $20 per share. It appears that Oxford may be overvalued according to this analysis.

28. This would almost definitely affect your valuation. With Lands’ End apparel in Sears stores, sales should increase. The current price is probably reflecting this additional growth potential.

29. ROE = Net income / Equity = $80 / $674 = 11.87%; Retention ratio = 1 - $24 / $80 = .70 Sustainable growth = 11.87%(.30) = 3.5086%

30. An increase in the quarterly dividend will decrease the growth rate as it will lower the retention ratio. A stock split affects none of the components, therefore will have no effect.

31. \[ V(0) = \left[ \frac{0.286(1.32)}{.15 - .32} \right] \left[ 1 - (1.32/1.14)^2 \right] + \left[ (1 + .32) / (1 + .13) \right] \left[ \frac{0.286(1.14)}{.14 - .13} \right] \]
\[ = 44.04 \]

32. P/E on next year’s earnings = .30 / (.14 - .13) = 30.00
33. Using the following relationships:
\[ P_0 = \frac{D_1}{k - g}; \quad \text{DPS}_1 = \text{EPS}_1(1 - b); \quad g = \text{ROE} \times b; \quad k = R_f + \beta(\text{MRP}) \]
The P/E ratio can be re-written as:
\[ \text{P/E} = \frac{(1 - b)}{[R_f + \beta(\text{MRP})] - (\text{ROE} \times b)} \]
\[ a. \] As the beta increases, the P/E ratio should decrease. The required return increases, decreasing the present value of the future dividends.
\[ b. \] As the growth rate increases, the P/E ratio increases.
\[ c. \] An increase in the payout ratio would increase the P/E ratio. Although b is in the numerator and the denominator, the effect is greater in the denominator.
\[ d. \] As the market risk premium increases, the P/E ratio decreases. The required return increases, decreasing the present value of the future dividends.

34. Signaling theory can explain the paradox. If investors believe that the increased dividend is a signal of no potential growth opportunities for the company, investors may re-evaluate the expected growth rate of the company. A lower growth rate could offset the higher dividend. It is also possible that investors believe the company does have potential growth opportunities, but is not exploiting them. In this case, the growth rate of the company would also be lowered.