

Lecture 5: Valuing Stocks

- 9-1. Assume Evco, Inc., has a current price of \$50 and will pay a \$2 dividend in one year, and its equity cost of capital is 15%. What price must you expect it to sell for right after paying the dividend in one year in order to justify its current price?

We can use Eq. (9.1) to solve for the price of the stock in one year given the current price of \$50.00, the \$2 dividend, and the 15% cost of capital.

$$50 = \frac{2 + X}{1.15}$$
$$X = 55.50$$

At a current price of \$50, we can expect Evco stock to sell for \$55.50 immediately after the firm pays the dividend in one year.

- 9-2. Anle Corporation has a current price of \$20, is expected to pay a dividend of \$1 in one year, and its expected price right after paying that dividend is \$22.

- What is Anle's expected dividend yield?
- What is Anle's expected capital gain rate?
- What is Anle's equity cost of capital?

- Div yld = $1/20 = 5\%$
- Cap gain rate = $(22 - 20)/20 = 10\%$
- Equity cost of capital = $5\% + 10\% = 15\%$

- 9-3. Suppose Acap Corporation will pay a dividend of \$2.80 per share at the end of this year and \$3 per share next year. You expect Acap's stock price to be \$52 in two years. If Acap's equity cost of capital is 10%:

- What price would you be willing to pay for a share of Acap stock today, if you planned to hold the stock for two years?
- Suppose instead you plan to hold the stock for one year. What price would you expect to be able to sell a share of Acap stock for in one year?
- Given your answer in part (b), what price would you be willing to pay for a share of Acap stock today, if you planned to hold the stock for one year? How does this compare to your answer in part (a)?

- $P(0) = 2.80 / 1.10 + (3.00 + 52.00) / 1.10^2 = \48.00
- $P(1) = (3.00 + 52.00) / 1.10 = \50.00
- $P(0) = (2.80 + 50.00) / 1.10 = \48.00

- 9-6. Summit Systems will pay a dividend of \$1.50 this year. If you expect Summit's dividend to grow by 6% per year, what is its price per share if its equity cost of capital is 11%?

$$P = 1.50 / (11\% - 6\%) = \$30$$

- 9-8. Kenneth Cole Productions (KCP), suspended its dividend at the start of 2009 and as of the middle of 2012, has not reinstated its dividend. Suppose you do not expect KCP to resume paying dividends until July 2014. You expect KCP's dividend in July 2014 to be \$1.00 (paid annually), and you expect it to grow by 5% per year thereafter. If KCP's equity cost of capital is 11%, what is the value of a share of KCP in July 2012?

$$P(2013) = \text{Div}(2014)/(r - g) = 1.00/ (.11 - .05) = \$16.67$$

$$P(2012) = 16.67/1.11 = \$15.02$$

9-9. In 2006 and 2007, Kenneth Cole Productions (KCP) paid annual dividends of \$0.72. In 2008, KCP paid an annual dividend of \$0.36, and then paid no further dividends through 2012. Suppose KCP was acquired at the end of 2012 for \$15.25 per share.

a. What would an investor with perfect foresight of the above been willing to pay for KCP at the start of 2006? (Note: Because an investor with perfect foresight bears no risk, use a risk-free equity cost of capital of 5%.)

b. Does your answer to (a) imply that the market for KCP stock was inefficient in 2006?

a. $P = 0.72/1.05 + 0.72/1.05^2 + 0.36/1.05^3 + 15.25/1.05^7 = \12.49

b. No, in 2006 investor expectations were likely very different—KCP might have continued to grow. Ex post the stock is likely to do better or worse than investors' expectations. The market would be inefficient only if the stock was overpriced relative to what would have been reasonable expectations in 2006.

9-10. DFB, Inc., expects earnings this year of \$5 per share, and it plans to pay a \$3 dividend to shareholders. DFB will retain \$2 per share of its earnings to reinvest in new projects with an expected return of 15% per year. Suppose DFB will maintain the same dividend payout rate, retention rate, and return on new investments in the future and will not change its number of outstanding shares.

a. What growth rate of earnings would you forecast for DFB?

b. If DFB's equity cost of capital is 12%, what price would you estimate for DFB stock?

c. Suppose DFB instead paid a dividend of \$4 per share this year and retained only \$1 per share in earnings. That is, it chose to pay a higher dividend instead of reinvesting in as many new projects. If DFB maintains this higher payout rate in the future, what stock price would you estimate now? Should DFB follow this new policy?

a. Eq 9.12: $g = \text{retention rate} \times \text{return on new invest} = (2/5) \times 15\% = 6\%$

b. $P = 3 / (12\% - 6\%) = \$50$

c. $g = (1/5) \times 15\% = 3\%$, $P = 4 / (12\% - 3\%) = \$44.44$. No, the projects are positive NPV (return exceeds cost of capital), so don't raise the dividend.

9-12. Procter & Gamble will pay an annual dividend of \$0.65 one year from now. Analysts expect this dividend to grow at 12% per year thereafter until the fifth year. After then, growth will level off at 2% per year. According to the dividend-discount model, what is the value of a share of Procter & Gamble stock if the firm's equity cost of capital is 8%?

Value of the first 5 dividend payments:

$$PV_{1-5} = \frac{0.65}{(0.08 - 0.12)} \left(1 - \left(\frac{1.12}{1.08} \right)^5 \right) = \$3.24.$$

Value on date 5 of the rest of the dividend payments:

$$PV_5 = \frac{0.65(1.12)^4 1.02}{0.08 - 0.02} = 17.39.$$

Discounting this value to the present gives

$$PV_0 = \frac{17.39}{(1.08)^5} = \$11.83.$$

So the value of Gillette is: $P = PV_{1-5} + PV_0 = 3.24 + 11.83 = \15.07 .

- 9-13. Colgate-Palmolive Company has just paid an annual dividend of \$0.96. Analysts are predicting an 11% per year growth rate in earnings over the next five years. After then, Colgate's earnings are expected to grow at the current industry average of 5.2% per year. If Colgate's equity cost of capital is 8.5% per year and its dividend payout ratio remains constant, what price does the dividend-discount model predict Colgate stock should sell for?**

PV of the first 5 dividends:

$$PV_{\text{first 5}} = \frac{0.96(1.11)}{0.085 - 0.11} \left(1 - \left(\frac{1.11}{1.085} \right)^5 \right) = 5.14217.$$

PV of the remaining dividends in year 5:

$$PV_{\text{remaining in year 5}} = \frac{0.96(1.11)^5 (1.052)}{0.085 - 0.052} = 51.5689.$$

Discounting back to the present

$$PV_{\text{remaining}} = \frac{51.5689}{(1.085)^5} = 34.2957.$$

Thus the price of Colgate is

$$P = PV_{\text{first 5}} + PV_{\text{remaining}} = 39.4378.$$

- 9-15. Halliford Corporation expects to have earnings this coming year of \$3 per share. Halliford plans to retain all of its earnings for the next two years. For the subsequent two years, the firm will retain 50% of its earnings. It will then retain 20% of its earnings from that point onward. Each year, retained earnings will be invested in new projects with an expected return of 25% per year. Any earnings that are not retained will be paid out as dividends. Assume Halliford's share count remains constant and all earnings growth comes from the investment of retained earnings. If Halliford's equity cost of capital is 10%, what price would you estimate for Halliford stock?**

See the spreadsheet for Halliford's dividend forecast:

	Year	0	1	2	3	4	5	6
Earnings								
1	EPS Growth Rate (vs. prior yr)			25%	25%	12.5%	12.5%	5%
2	EPS		\$3.00	\$3.75	\$4.69	\$5.27	\$5.93	\$6.23
Dividends								
3	Retention Ratio		100%	100%	50%	50%	20%	20%
4	Dividend Payout Ratio		0%	0%	50%	50%	80%	80%
5	Div (2×4)		—	—	\$2.34	\$2.64	\$4.75	\$4.98

From year 5 on, dividends grow at constant rate of 5%. Therefore,

$$P(4) = 4.75 / (10\% - 5\%) = \$95.$$

$$\text{Then } P(0) = 2.34 / 1.10^3 + (2.64 + 95) / 1.10^4 = \$68.45.$$

9-17. Maynard Steel plans to pay a dividend of \$3 this year. The company has an expected earnings growth rate of 4% per year and an equity cost of capital of 10%.

- a. Assuming Maynard's dividend payout rate and expected growth rate remains constant, and Maynard does not issue or repurchase shares, estimate Maynard's share price.
- b. Suppose Maynard decides to pay a dividend of \$1 this year and use the remaining \$2 per share to repurchase shares. If Maynard's total payout rate remains constant, estimate Maynard's share price.
- c. If Maynard maintains the dividend and total payout rate given in part (b), at what rate are Maynard's dividends and earnings per share expected to grow?

a. Earnings growth = EPS growth = dividend growth = 4%. Thus, $P = 3 / (10\% - 4\%) = \$50$.

b. Using the total payout model, $P = 3 / (10\% - 4\%) = \$50$.

c. $g = r_E - \text{Div Yield} = 10\% - 1/50 = 8\%$

9-24. You notice that PepsiCo (PEP) has a stock price of \$72.62 and EPS of \$3.80. Its competitor, the Coca-Cola Company (KO), has EPS of \$1.89. Estimate the value of a share of Coca-Cola stock using only this data.

PepsiCo P/E = $\$72.62 / \$3.80 = 19.1x$. Apply to Coca-Cola: $\$1.89 \times 19.1 = \36.10 .

9-26. Suppose that in January 2006, Kenneth Cole Productions had sales of \$518 million, EBITDA of \$55.6 million, excess cash of \$100 million, \$3 million of debt, and 21 million shares outstanding.



- a. Using the average enterprise value to sales multiple in Table 9.1, estimate KCP's share price.
- b. What range of share prices do you estimate based on the highest and lowest enterprise value to sales multiples in Table 9.1?
- c. Using the average enterprise value to EBITDA multiple in Table 9.1, estimate KCP's share price.
- d. What range of share prices do you estimate based on the highest and lowest enterprise value to EBITDA multiples in Table 9.1?

a. Estimated enterprise value for KCP = Average EV/Sales $\times$ KCP Sales = $1.06 \times \$518 \text{ million} = \549 million . Equity Value = EV – Debt + Cash = $\$549 - 3 + 100 = \646 million . Share price = Equity Value / Shares = $\$646 / 21 = \30.77

b. \$16.21 – \$58.64

c. Estimated enterprise value for KCP = Average EV/EBITDA $\times$ KCP EBITDA = $8.49 \times \$55.6 \text{ million} = \472 million . Share Price = $(\$472 - 3 + 100) / 21 = \27.10

d. \$22.25 – \$33.08