Chapter 9
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.

a. What is Anle’s expected dividend yield?

b. What is Anle’s expected capital gain rate?

c. What is Anle’s equity cost of capital?

a. Div yield = 1/20 = 5%

b. Cap gain rate = (22-20)/20 = 10%

c. 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%:

a. 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?

b. 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?

c. 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)?

a. \[ P(0) = \frac{2.80}{1.10} + \frac{3.00 + 52.00}{1.10^2} = \$48.00 \]

b. \[ P(1) = \frac{3.00 + 52.00}{1.10} = \$50.00 \]

c. \[ P(0) = \frac{2.80 + 50.00}{1.10} = \$48.00 \]
9-4. Krell Industries has a share price of $22 today. If Krell is expected to pay a dividend of $0.88 this year, and its stock price is expected to grow to $23.54 at the end of the year, what is Krell’s dividend yield and equity cost of capital?

Dividend Yield = 0.88 / 22.00 = 4%
Capital gain rate = (23.54 – 22.00) / 22.00 = 7%
Total expected return = \( r_E = 4\% + 7\% = 11\% \)

9-5. NoGrowth Corporation currently pays a dividend of $2 per year, and it will continue to pay this dividend forever. What is the price per share if its equity cost of capital is 15% per year?

With simplifying assumption (as was made in the chapter) that dividends are paid at the end of the year, then the stock pays a total of $2.00 in dividends per year. Valuing this dividend as a perpetuity, we have, \( P = \frac{2.00}{0.15} = 13.33 \).

Alternatively, if the dividends are paid quarterly, we can value them as a perpetuity using a quarterly discount rate of \( (1.15)^{\frac{1}{4}} - 1 = 3.556\% \) (see Eq. 5.1) then \( P = \frac{0.5010.03556}{0.03556} = 14.06 \).

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%?

\( P = \frac{1.50}{0.11 - 0.06} = 30 \)

9-7. Dorpac Corporation has a dividend yield of 1.5%. Dorpac’s equity cost of capital is 8%, and its dividends are expected to grow at a constant rate.

a. What is the expected growth rate of Dorpac’s dividends?
b. What is the expected growth rate of Dorpac’s share price?

a. Eq 9.7 implies \( r_E = \text{Div Yld} + g \), so \( 8\% - 1.5\% = g \). 6.5%.
b. With constant dividend growth, share price is also expected to grow at rate \( g = 6.5\% \) (or we can solve this from Eq 9.2).

9-8. Kenneth Cole Productions (KCP), suspended its dividend at the start of 2009. Suppose you do not expect KCP to resume paying dividends until 2011. You expect KCP’s dividend in 2011 to be $0.40 per year (paid at the end of the year), 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 at the start of 2009?

\( P(2010) = \frac{0.40}{0.11 - 0.05} = 6.67 \)
\( P(2009) = \frac{6.67}{1.11^2} = 5.41 \)

9-9. 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. If DFB maintains this higher payout rate in the future, what stock price would you estimate now? Should DFB raise its dividend?

a. Eq 9.12: \( g = \text{retention rate} \times \text{return on new invest} = (2/5) \times 15\% = 6\% \)
b. \( P = \frac{3}{(12\% - 6\%)} = 50 \)
c. \( g = (1/5) \times 15\% = 3\% \), \( P = 4 / (12\% - 3\%) = $44.44 \). No, projects are positive NPV (return exceeds cost of capital), so don’t raise dividend.

9-10. Cooperton Mining just announced it will cut its dividend from $4 to $2.50 per share and use the extra funds to expand. Prior to the announcement, Cooperton’s dividends were expected to grow at a 3% rate, and its share price was $50. With the new expansion, Cooperton’s dividends are expected to grow at a 5% rate. What share price would you expect after the announcement? (Assume Cooperton’s risk is unchanged by the new expansion.) Is the expansion a positive NPV investment?

Estimate \( r_E = \text{Div Yield} + g = 4 / 50 + 3\% = 11\% \)

New Price: \( P = 2.50 / (11\% - 5\%) = $41.67 \)

In this case, cutting the dividend to expand is not a positive NPV investment.

9-11. Gillette Corporation 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 Gillette 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:

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

Discounting this value to the present gives

\[
PV_0 = \frac{17.39}{1.08^5} = $11.83.
\]

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

9-12. 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:

\[
PV_{\text{remaining in year 5}} = \frac{0.96(1.11)^4 \times (1.052)}{0.085 - 0.052} = 51.5689.
\]

Discounting back to the present

\[
PV_{\text{remaining}} = \frac{51.5689}{(1.085)^5} = 34.2957.
\]
Thus the price of Colgate is

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

9-13. What is the value of a firm with initial dividend \( \text{Div}_0 \) growing for \( n \) years (i.e., until year \( n + 1 \)) at rate \( g_1 \) and after that at rate \( g_2 \) forever, when the equity cost of capital is \( r \)?

\[
P_0 = \frac{\text{Div}_1}{r - g_1} \left[ \frac{1}{(1 + g_1)^n} \right] + \frac{\text{Div}_1}{(1 + r)^n} \left[ \frac{1 + g_1}{r - g_2} \right] \quad \text{PV of terminal value}
\]

\[
= \frac{\text{Div}_1}{r - g_1} + \left( \frac{1 + g_1}{r - g_2} \right) \left( \frac{\text{Div}_1 - \text{Div}_1}{r - g_1} \right) \quad \text{present value of difference of perpetuities in year } n
\]

9-14. 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:

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings&lt;br&gt;EPS Growth Rate (vs. prior yr)</td>
<td>25%</td>
<td>25%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPS</td>
<td>$3.00</td>
<td>$3.75</td>
<td>$4.69</td>
<td>$5.27</td>
<td>$5.93</td>
<td>$6.23</td>
<td></td>
</tr>
<tr>
<td>Dividends&lt;br&gt;Retention Ratio</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
<td>20%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Dividend Payout Ratio</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
<td>80%</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Div (2 × 4)</td>
<td>—</td>
<td>—</td>
<td>$2.34</td>
<td>$2.64</td>
<td>$4.75</td>
<td>$4.98</td>
<td></td>
</tr>
</tbody>
</table>

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

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

Then \[ P(0) = 2.34 / 1.10^3 + (2.64 + 95) / 1.10^4 = $68.45. \]

9-15. Suppose Cisco Systems pays no dividends but spent $5 billion on share repurchases last year. If Cisco’s equity cost of capital is 12%, and if the amount spent on repurchases is expected to grow by 8% per year, estimate Cisco’s market capitalization. If Cisco has 6 billion shares outstanding, what stock price does this correspond to?

Total payout next year = $5 billion × 1.08 = $5.4 billion

Equity Value = $5.4 / (12% - 8%) = $135 billion

Share price = $135 / 6 = $22.50
9-16. 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. \[ g = \frac{r_E}{1 - \frac{1}{P}} = \frac{10\%}{1 - \frac{1}{50}} = 8\% \]

9-17. Benchmark Metrics, Inc. (BMI), an all-equity financed firm, just reported EPS of $5.00 per share for 2008. Despite the economic downturn, BMI is confident regarding its current investment opportunities. But due to the financial crisis, BMI does not wish to fund these investments externally. The Board has therefore decided to suspend its stock repurchase plan and cut its dividend to $1 per share (vs. almost $2 per share in 2007), and retain these funds instead. The firm has just paid the 2008 dividend, and BMI plans to keep its dividend at $1 per share in 2009 as well. In subsequent years, it expects its growth opportunities to slow, and it will still be able to fund its growth internally with a target 40% dividend payout ratio, and reinitiating its stock repurchase plan for a total payout rate of 60%. (All dividends and repurchases occur at the end of each year.)

Suppose BMI’s existing operations will continue to generate the current level of earnings per share in the future. Assume further that the return on new investment is 15%, and that reinvestments will account for all future earnings growth (if any). Finally, assume BMI’s equity cost of capital is 10%.


b. What is the value of a share of BMI at the start of 2009?

a. To calculate earnings growth, we can use the formula: \( g = (\text{retention rate}) \times \text{RONI} \).

In 2008, BMI retains $4 of its $5 in EPS, for a retention rate of 80%, and an earnings growth rate of 80% × 15% = 12%. Thus, EPS2009 = $5.00 × (1.12) = $5.60.

In 2009, BMI retains $4.60 of its $5.60 in EPS, for a retention rate of 82.14% and an earnings growth rate of 82.14% × 15% = 12.32%. So, EPS2010 = $5.60 × (1.1232) = $6.29.

b. From 2010 on, the firm plans to retain 40% of EPS, for a growth rate of 40% × 15% = 6%.

Total Payouts in 2010 are 60% of EPS, or 60% × $6.29 = $3.774.

Thus, the value of the stock at the end of 2009 is, given the 6% future growth rate,

\[ P2009 = \frac{3.77}{10\% - 6\%} = 94.35. \]

Given the $1 dividend in 2009, we get a share price in 2008 of

\[ P2008 = (1 + 94.35)/1.10 = 86.68. \]
9-18. Heavy Metal Corporation is expected to generate the following free cash flows over the next five years:

<table>
<thead>
<tr>
<th>Year</th>
<th>FCF ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>3</td>
<td>78</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
</tr>
<tr>
<td>5</td>
<td>82</td>
</tr>
</tbody>
</table>

After then, the free cash flows are expected to grow at the industry average of 4% per year. Using the discounted free cash flow model and a weighted average cost of capital of 14%:

a. Estimate the enterprise value of Heavy Metal.

\[
V(4) = \frac{82}{14\% - 4\%} = $820
\]

\[
V(0) = \frac{53}{1.14} + \frac{68}{1.14^2} + \frac{78}{1.14^3} + \frac{75 + 820}{1.14^4} = $681
\]

b. If Heavy Metal has no excess cash, debt of $300 million, and 40 million shares outstanding, estimate its share price.

\[
P = \frac{681 + 0 - 300}{40} = $9.53
\]

9-19. IDX Technologies is a privately held developer of advanced security systems based in Chicago. As part of your business development strategy, in late 2008 you initiate discussions with IDX’s founder about the possibility of acquiring the business at the end of 2008. Estimate the value of IDX per share using a discounted FCF approach and the following data:

- Debt: $30 million
- Excess cash: $110 million
- Shares outstanding: 50 million
- Expected FCF in 2009: $45 million
- Expected FCF in 2010: $50 million
- Future FCF growth rate beyond 2010: 5%
- Weighted-average cost of capital: 9.4%

From 2010 on, we expect FCF to grow at a 5% rate. Thus, using the growing perpetuity formula, we can estimate IDX’s Terminal Enterprise Value in 2009 = $50/(9.4\% - 5\%) = $1136.

Adding the 2009 cash flow and discounting, we have

\[
\text{Enterprise Value in 2008} = \frac{($45 + $1136)}{1.094} = $1080.
\]

Adjusting for Cash and Debt (net debt), we estimate an equity value of

\[
\text{Equity Value} = $1080 + 110 - 30 = $1160.
\]

Dividing by number of shares:

\[
\text{Value per share} = \frac{$1160}{50} = $23.20.
\]
9-20. Sora Industries has 60 million outstanding shares, $120 million in debt, $40 million in cash, and the following projected free cash flow for the next four years:

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>433.0</td>
<td>468.0</td>
<td>516.0</td>
<td>547.0</td>
<td>574.3</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>(313.6)</td>
<td>(345.7)</td>
<td>(366.5)</td>
<td>(384.8)</td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td>154.4</td>
<td>170.3</td>
<td>180.5</td>
<td>189.5</td>
<td></td>
</tr>
<tr>
<td>Selling, General, and Administrative</td>
<td>(93.6)</td>
<td>(103.2)</td>
<td>(109.4)</td>
<td>(114.9)</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>(7.0)</td>
<td>(7.5)</td>
<td>(9.0)</td>
<td>(9.5)</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>53.8</td>
<td>59.6</td>
<td>62.1</td>
<td>65.2</td>
<td></td>
</tr>
<tr>
<td>Less: Income Tax at 40%</td>
<td>(21.5)</td>
<td>(23.8)</td>
<td>(24.8)</td>
<td>(26.1)</td>
<td></td>
</tr>
<tr>
<td>Plus: Depreciation</td>
<td>7.0</td>
<td>7.5</td>
<td>9.0</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>Less: Capital Expenditures</td>
<td>(7.7)</td>
<td>(10.0)</td>
<td>(9.9)</td>
<td>(10.4)</td>
<td></td>
</tr>
<tr>
<td>Less: Increase in NWC</td>
<td>(8.3)</td>
<td>(8.6)</td>
<td>(5.6)</td>
<td>(4.9)</td>
<td></td>
</tr>
<tr>
<td>Free Cash Flow</td>
<td>25.3</td>
<td>24.6</td>
<td>30.8</td>
<td>33.3</td>
<td></td>
</tr>
</tbody>
</table>

a. Suppose Sora’s revenue and free cash flow are expected to grow at a 5% rate beyond year 4. If Sora’s weighted average cost of capital is 10%, what is the value of Sora’s stock based on this information?

b. Sora’s cost of goods sold was assumed to be 67% of sales. If its cost of goods sold is actually 70% of sales, how would the estimate of the stock’s value change?

c. Let’s return to the assumptions of part (a) and suppose Sora can maintain its cost of goods sold at 67% of sales. However, now suppose Sora reduces its selling, general, and administrative expenses from 20% of sales to 16% of sales. What stock price would you estimate now? (Assume no other expenses, except taxes, are affected.)

d. Sora’s net working capital needs were estimated to be 18% of sales (which is their current level in year 0). If Sora can reduce this requirement to 12% of sales starting in year 1, but all other assumptions remain as in part (a), what stock price do you estimate for Sora? (Hint: This change will have the largest impact on Sora’s free cash flow in year 1.)

a. \[ V(3) = \frac{33.3}{(10\% - 5\%)} = 666 \]
\[ V(0) = \frac{25.3}{1.10} + \frac{24.6}{1.10^2} + \frac{30.8 + 666}{1.10^3} = 567 \]
\[ P(0) = \frac{567 + 40 - 120}{60} = $8.11 \]
b. Free cash flows change as follows:

Hence \( V(3) = 458 \), and \( V(0) = 388 \). Thus, \( P(0) = $5.13 \).

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>433.00</td>
<td>468.00</td>
<td>516.00</td>
<td>546.96</td>
<td>574.31</td>
<td>603.02</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>(313.56)</td>
<td>(345.72)</td>
<td>(366.46)</td>
<td>(384.79)</td>
<td>(404.03)</td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td>154.44</td>
<td>170.28</td>
<td>180.50</td>
<td>189.52</td>
<td>199.00</td>
<td></td>
</tr>
<tr>
<td>Selling, General &amp; Admin.</td>
<td>(74.88)</td>
<td>(82.56)</td>
<td>(87.51)</td>
<td>(91.89)</td>
<td>(96.48)</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>(7.00)</td>
<td>(7.50)</td>
<td>(9.00)</td>
<td>(9.45)</td>
<td>(9.92)</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>72.56</td>
<td>80.22</td>
<td>83.98</td>
<td>88.18</td>
<td>92.59</td>
<td></td>
</tr>
<tr>
<td>Income tax at 40%</td>
<td>(29.02)</td>
<td>(32.09)</td>
<td>(33.59)</td>
<td>(35.27)</td>
<td>(37.04)</td>
<td></td>
</tr>
<tr>
<td>Unlevered Net Income</td>
<td>43.54</td>
<td>48.13</td>
<td>50.39</td>
<td>52.91</td>
<td>55.55</td>
<td></td>
</tr>
</tbody>
</table>

Free Cash Flow ($000s)

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plus: Depreciation</td>
<td>7.00</td>
<td>7.50</td>
<td>9.00</td>
<td>9.45</td>
<td>9.92</td>
<td></td>
</tr>
<tr>
<td>Less: Capital Expenditures</td>
<td>(7.70)</td>
<td>(10.00)</td>
<td>(9.90)</td>
<td>(10.40)</td>
<td>(10.91)</td>
<td></td>
</tr>
<tr>
<td>Less: Increases in NWC</td>
<td>(6.30)</td>
<td>(8.64)</td>
<td>(5.57)</td>
<td>(4.92)</td>
<td>(5.17)</td>
<td></td>
</tr>
<tr>
<td>Free Cash Flow</td>
<td>36.54</td>
<td>36.99</td>
<td>43.92</td>
<td>47.04</td>
<td>49.39</td>
<td></td>
</tr>
</tbody>
</table>

c. New FCF:

Now \( V(3) = 941 \), \( V(0) = 804 \), \( P(0) = $12.07 \)

d. Inc in NWC in yr1 = 12% Sales(1) – 18% Sales(0)

Inc in NWC in later years = 12% × change in sales

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>433.00</td>
<td>468.00</td>
<td>516.00</td>
<td>546.96</td>
<td>574.31</td>
<td>603.02</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>(313.56)</td>
<td>(345.72)</td>
<td>(366.46)</td>
<td>(384.79)</td>
<td>(404.03)</td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td>154.44</td>
<td>170.28</td>
<td>180.50</td>
<td>189.52</td>
<td>199.00</td>
<td></td>
</tr>
<tr>
<td>Selling, General &amp; Admin.</td>
<td>(93.60)</td>
<td>(103.20)</td>
<td>(109.39)</td>
<td>(114.86)</td>
<td>(120.60)</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>(7.00)</td>
<td>(7.50)</td>
<td>(9.00)</td>
<td>(9.45)</td>
<td>(9.92)</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>53.84</td>
<td>59.58</td>
<td>62.10</td>
<td>65.21</td>
<td>68.47</td>
<td></td>
</tr>
<tr>
<td>Income tax at 40%</td>
<td>(21.54)</td>
<td>(23.83)</td>
<td>(24.84)</td>
<td>(26.08)</td>
<td>(27.39)</td>
<td></td>
</tr>
<tr>
<td>Unlevered Net Income</td>
<td>32.30</td>
<td>35.75</td>
<td>37.26</td>
<td>39.13</td>
<td>41.08</td>
<td></td>
</tr>
</tbody>
</table>

Free Cash Flow ($000s)

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plus: Depreciation</td>
<td>7.00</td>
<td>7.50</td>
<td>9.00</td>
<td>9.45</td>
<td>9.92</td>
<td></td>
</tr>
<tr>
<td>Less: Capital Expenditures</td>
<td>(7.70)</td>
<td>(10.00)</td>
<td>(9.90)</td>
<td>(10.40)</td>
<td>(10.91)</td>
<td></td>
</tr>
<tr>
<td>Less: Increases in NWC</td>
<td>(6.30)</td>
<td>(8.64)</td>
<td>(5.57)</td>
<td>(4.92)</td>
<td>(5.17)</td>
<td></td>
</tr>
<tr>
<td>Free Cash Flow</td>
<td>53.38</td>
<td>27.49</td>
<td>32.65</td>
<td>34.90</td>
<td>36.64</td>
<td></td>
</tr>
</tbody>
</table>

New FCF:

Now \( V(3) = 698 \), \( V(0) = 620 \), \( P(0) = $9.00 \)


a. Suppose you believe KCP’s initial revenue growth rate will be between 4% and 11% (with growth slowing in equal steps to 4% by year 2011). What range of share prices for KCP is consistent with these forecasts?

b. Suppose you believe KCP’s EBIT margin will be between 7% and 10% of sales. What range of share prices for KCP is consistent with these forecasts (keeping KCP’s initial revenue growth at 9%)?

c. Suppose you believe KCP’s weighted average cost of capital is between 10% and 12%. What range of share prices for KCP is consistent with these forecasts (keeping KCP’s initial revenue growth and EBIT margin at 9%)?
d. What range of share prices is consistent if you vary the estimates as in parts (a), (b), and (c) simultaneously?
   a. $22.85 - $25.68
   b. $19.60 - $27.50
   c. $22.24 --- $28.34
   d. $16.55 --- $32.64

9-22. You notice that PepsiCo has a stock price of $52.66 and EPS of $3.20. Its competitor, the Coca-Cola Company, has EPS of $2.49. Estimate the value of a share of Coca-Cola stock using only this data.

PepsiCo P/E = 52.66/3.20 = 16.46x. Apply to Coca-Cola: $2.49 \times 16.46 = $40.98.

   a. Using the average P/E 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 P/E multiples in Table 9.1?
   c. Using the average price to book value 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 price to book value multiples in Table 9.1?

   a. Share price = Average P/E \times KCP EPS = 15.01 \times $1.65 = $24.77
   b. Minimum = 8.66 \times $1.65 = $14.29, Maximum = 22.62 \times $1.65 = $37.32
   c. 2.84 \times $12.05 = $34.22
   d. 1.12 \times $12.05 = $13.50, 8.11 \times $12.05 = $97.73

   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 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. Est. enterprise value for KCP = Average EV/EBITDA \times KCP EBITDA = 8.49 \times $55.6 million = $472 million. Share Price = ($472 – 3 + 100)/21 = $27.10
   d. $22.25 – $33.08
9-25. In addition to footwear, Kenneth Cole Productions designs and sells handbags, apparel, and other accessories. You decide, therefore, to consider comparables for KCP outside the footwear industry.

a. Suppose that Fossil, Inc., has an enterprise value to EBITDA multiple of 9.73 and a P/E multiple of 18.4. What share price would you estimate for KCP using each of these multiples, based on the data for KCP in Problems 23 and 24?

b. Suppose that Tommy Hilfiger Corporation has an enterprise value to EBITDA multiple of 7.19 and a P/E multiple of 17.2. What share price would you estimate for KCP using each of these multiples, based on the data for KCP in Problems 23 and 24?

9-26. Consider the following data for the airline industry in early 2009 (EV = enterprise value, BV = book value, NM = not meaningful because divisor is negative). Discuss the challenges of using multiples to value an airline.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Market Cap</th>
<th>EV</th>
<th>EV/Sales</th>
<th>EV/EBITDA</th>
<th>EV/EBIT</th>
<th>P/E</th>
<th>P/Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta Air Lines</td>
<td>4,799.6</td>
<td>16,807.6</td>
<td>0.7x</td>
<td>15.0x</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>AMR Corp.</td>
<td>1,296.5</td>
<td>8,743.5</td>
<td>0.4x</td>
<td>17.5x</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>JetBlue Airways</td>
<td>1,246.9</td>
<td>3,834.9</td>
<td>1.1x</td>
<td>10.4x</td>
<td>25.7x</td>
<td>NM</td>
<td>1.0x</td>
</tr>
<tr>
<td>Continental Airlines</td>
<td>1,216.8</td>
<td>4,506.8</td>
<td>0.3x</td>
<td>14.7x</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>UAL Corp.</td>
<td>701.0</td>
<td>6,192.0</td>
<td>0.3x</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>AirTran Holdings</td>
<td>651.3</td>
<td>1,354.7</td>
<td>0.5x</td>
<td>21.7x</td>
<td>NM</td>
<td>NM</td>
<td>2.3x</td>
</tr>
<tr>
<td>SkyWest</td>
<td>588.7</td>
<td>1,699.7</td>
<td>0.5x</td>
<td>3.8x</td>
<td>73.8x</td>
<td>6.5x</td>
<td>0.6x</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>257.1</td>
<td>262.1</td>
<td>0.2x</td>
<td>1.7x</td>
<td>2.7x</td>
<td>3.6x</td>
<td>NM</td>
</tr>
<tr>
<td>Pinnacle Airlines</td>
<td>44.0</td>
<td>699.7</td>
<td>0.6x</td>
<td>6.0x</td>
<td>10.1x</td>
<td>3.4x</td>
<td>1.0x</td>
</tr>
</tbody>
</table>

Source: Capital IQ

All the multiples show a great deal of variation across firms. This makes the use of multiples problematic because there is clearly more to valuation than the multiples reveal. Without a clear understanding of what drives the differences in multiples across airlines, it is unclear what the “correct” multiple to use is when trying to value a new airline.

9-27. You read in the paper that Summit Systems from Problem 6 has revised its growth prospects and now expects its dividends to grow at 3% per year forever.

a. What is the new value of a share of Summit Systems stock based on this information?

b. If you tried to sell your Summit Systems stock after reading this news, what price would you be likely to get and why?

a. \[ P = \frac{1.50}{11\% - 3\%} = $18.75. \]

b. Given that markets are efficient, the new growth rate of dividends will already be incorporated into the stock price, and you would receive $18.75 per share. Once the information about the revised growth rate for Summit Systems reaches the capital market, it will be quickly and efficiently reflected in the stock price.
9-28. In early 2009, Coca-Cola Company had a share price of $46. Its dividend was $1.52, and you expect Coca-Cola to raise this dividend by approximately 7% per year in perpetuity.

a. If Coca-Cola’s equity cost of capital is 8%, what share price would you expect based on your estimate of the dividend growth rate?

\[ P = \frac{1.52}{(8\% - 7\%)} = \$152 \]

b. Given Coca-Cola’s share price, what would you conclude about your assessment of Coca-Cola’s future dividend growth?

\[ P = \frac{1.52}{r_e - \text{div yield}} = \frac{1.52}{8\% - 1.52/46} = 4.70\% \text{, which is more reasonable.} \]

9-29. Roybus, Inc., a manufacturer of flash memory, just reported that its main production facility in Taiwan was destroyed in a fire. While the plant was fully insured, the loss of production will decrease Roybus’ free cash flow by $180 million at the end of this year and by $60 million at the end of next year.

a. If Roybus has 35 million shares outstanding and a weighted average cost of capital of 13%, what change in Roybus’ stock price would you expect upon this announcement? (Assume the value of Roybus’ debt is not affected by the event.)

\[ \text{PV(change in FCF)} = \frac{-180}{1.13} - \frac{60}{(1.13)^2} = -206 \]

\[ \text{Change in V} = -206, \text{ so if debt value does not change, P drops by 206/35 = $5.89 per share.} \]

b. Would you expect to be able to sell Roybus’ stock on hearing this announcement and make a profit? Explain.

If this is public information in an efficient market, share price will drop immediately to reflect the news, and no trading profit is possible.

9-30. Apnex, Inc., is a biotechnology firm that is about to announce the results of its clinical trials of a potential new cancer drug. If the trials were successful, Apnex stock will be worth $70 per share. If the trials were unsuccessful, Apnex stock will be worth $18 per share. Suppose that the morning before the announcement is scheduled, Apnex shares are trading for $55 per share.

a. Based on the current share price, what sort of expectations do investors seem to have about the success of the trials?

b. Suppose hedge fund manager Paul Klener has hired several prominent research scientists to examine the public data on the drug and make their own assessment of the drug’s promise. Would Klener’s fund be likely to profit by trading the stock in the hours prior to the announcement?

c. What would limit the fund’s ability to profit on its information?

a. Market seems to assess a somewhat greater than 50% chance of success.

b. Yes, if they have better information than other investors.

c. Market may be illiquid; no one wants to trade if they know Klener has better info. Klener’s trades will move prices significantly, limiting profits.