

CHAPTER FIFTEEN

Full-Information Forecasting, Valuation, and Business Strategy Analysis

Concept Questions

C15.1 To forecast future financial statements, the analyst must know where the business is going. He must also have an idea of the key drivers that will determine the future financial statements, and these key drivers are determined by the business concept and by customers' acceptance to the concept. Firms gain an edge over their competition by innovative business concepts.

C15.2 Fade diagrams give the typical patterns (within industries) of changes in drivers over time. The forecaster takes these patterns as a starting point and asks how the individual firm in question might be different from the average firm.

C15.3 Competition is the primary determinant. But the ability of a firm to challenge the competition slows the fade rate.

C15.4 Pro forma financial statements have integrity if the various parts tie together according to the accounting relations that govern the statements.

C15.5 Values are calculated from forecasts of operations, and dividends do not affect operations. Dividends, rather, are a disposition of the free cash flow from operations.

C15.6 A red flag indicator is a feature within or outside the financial statements that indicates deterioration in profitability in the future.

C15.7 An unarticulated strategy is a business idea that is not developed enough to quantify it into pro forma statements. A strategy to research into a cure for cancer does not lend itself readily to financial valuation.

C15.8 When shares are issued in a merger or acquisition, the analyst must be concerned with the division of the value of the merged company between the shareholders of the two firms in the merger. That division is determined by the terms under which shares are issued in the merger (and thus how much each shareholder receives per share).

C15.9 A firm generates value for shareholders when it buys the firm's shares at less than intrinsic value. If management considers the shares to be undervalued in the market, buying them generates value. It is also argued that leveraged buyouts incentivize management – because they have to service the high debt load.

C15.10 The acquirer's shares will decline if the market thinks the acquirer is overpaying for the acquisition. This may be because the acquiree's shares are overpriced – possibly driven up by bidding from a number of potential acquirers – or because the acquirer offers unfavorable terms (to itself) in a share exchange. The acquirer's share price might also decline if the market views the merger as one where the acquirer is using its overvalued shares to make an acquisition, and thus views the merger announcement as a signal of that overvaluation.

Exercises

E15.1 Analysis of Value Added

Pro forma and valuation under the status quo:

0 1 2 3

| | | | | | |
|---|-------|-------|-------|-------|---------------|
| Sales | 857.0 | 882.7 | 909.2 | 936.5 | (grows at 3%) |
| Operating income (PM = 7%) | 60.0 | 61.8 | 63.6 | 65.6 | (grows at 3%) |
| Net operating assets | 441 | 454.2 | 467.8 | 481.9 | (grows at 3%) |
| PM | 7% | 7% | 7% | 7% | |
| ATO | 2.0 | 2.0 | 2.0 | 2.0 | |
| RNOA | 14% | 14% | 14% | 14% | |
| ReOI | | 17.64 | 18.18 | 18.73 | (grows at 3%) |
| Value of operations under the status quo: | | | | | |

$$\begin{aligned}\text{Value of NOA} &= 441 + \frac{17.64}{1.10 - 1.03} \\ &= 693\end{aligned}$$

Pro forma and valuation under the plan:

| | 0 | 1 | 2 | 3 | |
|--------------------------------------|--------|--------|--------|--------|---------------|
| Sales | 857.0 | 891.3 | 926.9 | 964.0 | (grows at 4%) |
| Operating income (PM = 7%) | 60.0 | 62.4 | 64.9 | 67.5 | (grows at 4%) |
| Net operating assets (ATO = 1.67) | 534.8 | 556.1 | 578.4 | 601.6 | (grows at 4%) |
| PM | 7% | 7% | 7% | 7% | |
| ATO | 1.67 | 1.67 | 1.67 | 1.67 | |
| RNOA | 11.67% | 11.67% | 11.67% | 11.67% | |
| ReOI | | 8.93 | 9.29 | 9.66 | (grows at 4%) |

Value of operations under the plan:

$$\begin{aligned}
 \text{Value of NOA} &= 534.8 + \frac{8.93}{1.10 - 1.04} \\
 &= 684
 \end{aligned}$$

The plan (marginally) loses value. The additional growth (that generates additional profit margin) is not sufficient to cover the required return on the additional investment in net operating assets.

E15.2 Forecasting Free Cash Flows and Residual Operating income, and Valuing a Firm

(a)

| | <u>2004</u> | <u>2005</u> | <u>2006</u> | <u>2007</u> | <u>2008</u> |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| Free cash flow (C – I = d) | 70 | 75 | 75 | 75 | 75 |
| Investment (I) | <u>80</u> | <u>89</u> | <u>94</u> | <u>95</u> | <u>95</u> |
| <u>Cash from operations (C)</u> | <u>150</u> | <u>164</u> | <u>169</u> | <u>170</u> | <u>170</u> |

As the firm is “pure equity” (no debt), free cash flow (C - I) is equal to dividends.

Forecast operating income and residual operating income:

| | <u>2004</u> | <u>2005</u> | <u>2006</u> | <u>2007</u> | <u>2008</u> |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|
| ΔNOA | 39 | 30 | 24 | 14 | 9 |
| C – I | <u>70</u> | <u>75</u> | <u>75</u> | <u>75</u> | <u>75</u> |
| OI | <u>109</u> | <u>105</u> | <u>99</u> | <u>89</u> | <u>84</u> |
| Beginning net operating assets | 596 | 635 | 665 | 689 | 703 |
| ReOI (0.12) | 37 | 29 | 19 | 6 | 0 |

As the firm is a “pure equity” firm, net operating assets (NOA) equal common shareholders’ equity (CSE) and operating income (OI) equals comprehensive income.

And comprehensive income equals ΔCSE + dividends. As an alternative calculation,

OI = C – I + ΔNOA (as above),

(b) Based on the forecasted ReOI,

$$\begin{aligned} \text{Value} &= 596 + \frac{37}{1.12} + \frac{29}{1.12^2} + \frac{19}{1.12^3} + \frac{6}{1.12^4} \\ &= 669.5 \end{aligned}$$

(c)

Using DCF analysis:

$$\text{Value} = \frac{70}{1.12} + \left(\frac{75}{0.12} \right) / 1.12$$
$$= 620.5$$

The 75 in free cash flow after 2001 looks like a perpetuity, so has been capitalized as such in this valuation. But free cash flow cannot be a perpetuity at 75. If the firm were to hold net operating assets at 712 and thus earn 84 in operating income (to yield a zero ReOI), free cash flow would be 84. If the firm were to maintain a zero ReOI after 2008 and still grow net operating assets, free cash would have to change from 75 and also grow.

E15.3 Evaluating a Marketing Plan

(a)

This is an SF3 valuation:

$$\text{Value of operations}_0 = \text{NOA}_0 + \frac{\overline{\text{ReOI}}_1}{\rho_F - g}$$

$$\begin{aligned}\overline{\text{ReOI}}_1 &= (15\% - 11\%) \times 498 \\ &= 19.92\end{aligned}$$

For a profit margin (PM) of 7.5% and an RNOA of 15%, the ATO must be 2.0.

With a constant ATO (implied by the constant PM and RNOA), the growth in ReOI is given by the growth in sales. So,

$$\begin{aligned}\text{Value of operations} &= 498 + \frac{19.92}{1.11 - 1.06} \\ &= \$896 \text{ million}\end{aligned}$$

(b)

A reduction of the ATO to 1.9 would reduce forecasted profitability (RNOA) to 14.25%:

$$\begin{aligned}\text{RNOA} &= \text{PM} \times \text{ATO} \\ &= 7.5\% \times 1.9 \\ &= 14.25\%\end{aligned}$$

Under the status quo, residual operating income is expected to be generated as follows:

| Year | NOA at beginning | Sales | PM | ATO | RNOA | ReOI | ReOI Growth |
|------|------------------|---------|------|-----|------|-------|-------------|
| 1 | 498.0 | 996.0 | 7.5% | 2.0 | 15% | 19.92 | --- |
| 2 | 527.9 | 1,055.8 | 7.5% | 2.0 | 15% | 21.12 | 6% |

| | | | | | | | |
|--------|-------|---------|------|-----|-----|-------|----|
| 3 ↓ | 559.6 | 1,119.2 | 7.5% | 2.0 | 15% | 22.38 | 6% |
|--------|-------|---------|------|-----|-----|-------|----|

Under the marketing plan, residual operating income is expected to be generated as follows:

| Year | NOA of beginning | Sales | PM | ATO | RNOA | ReOI | ReOI Growth |
|------|------------------|---------|------|-----|--------|-------|-------------|
| 1 | 498.0 | 996.0 | 7.5% | 2.0 | 14.25% | 19.92 | ---- |
| 2 | 557.0 | 1,058.3 | 7.5% | 1.9 | 14.25% | 18.10 | 6.25% |
| 3 | 591.8 | 1,124.4 | 7.5% | 1.9 | 14.25% | 19.23 | 6.25% |
| ↓ | 628.8 | 1,194.7 | 7.5% | 1.9 | 14.25% | 20.44 | 6.25% |

[The plan is implemented in year 1, to take effect in year 2.]

The valuation under the plan is

$$\text{Value of operations} = \text{NOA} + \frac{\overline{\text{ReOI}}_1}{1.11} + \left(\frac{\overline{\text{ReOI}}_2}{1.11 - 1.0625} \right) / 1.11$$

$$= 498 + \frac{19.92}{1.11} + \left(\frac{18.10}{0.0475} \right) / 1.11$$

$$= \$859 \text{ million}$$

The plan reduces the value calculated in part (a). The additional investment in receivables loses value (when charged at the required return) even though it generates more value from the additional operating income that comes from the additional sales growth.

E15.4 One-Step Residual Operating Income Calculation: Coca-Cola

The one-step calculation of residual operating income is:

$$\text{ReOI} = \text{Sales} \times \left[\text{PM} - \frac{\text{Required Return for Operations}}{\text{ATO}} \right]$$

$$= \$18.868 \times \left(0.221 - \frac{0.09}{2.2} \right)$$

$$= \$3.398 \text{ billion}$$

(This is close to the “economic profit” that Coke reports).

The profit margin is the total profit margin. The one-step calculation can be adapted to a split of operating income between core income from sales, core other income, and unusual items, as in calculation 15.1 in the text.

E15.5. A Valuation from Operating Income Growth Forecasts: Nike

(a)

The pro forma:

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---------------------|-------|-------|-------|-------|-------|-------|
| ReOI | 389.3 | 467.1 | 527.9 | 554.3 | 582.0 | 611.1 |
| Abnormal OI growth | | 77.8 | 60.8 | 26.4 | 27.7 | 29.1 |
| Growth rate of AOIG | | | | | 5% | 5% |
| Operating income | 681.8 | | | | | |

Notes:

AOIG is equal to the change in residual operating income (ReOI) given in Box 15.1 in Chapter 15. From 2000 onwards, ReOI is forecasted to grow at a 5% rate – and thus so is AOIG, for AOIG is always the change in ReOI.

Operating income for 1997 is the OI implicit in the ReOI of \$389.3:

$$\begin{aligned}
 \text{OI} &= (\text{NOA} \times 0.11) + \text{ReOI} \\
 &= (2,659 \times 0.11) + 398.3 \\
 &= 681.8
 \end{aligned}$$

The valuation from this pro forma (cost of capital for operations is 11%):

| | 1997 | 1998 | 1999 |
|--|----------------|------|---|
| Discount factor | | 1.11 | 1.232 |
| PV of AOIG | | 70.1 | 49.4 (discounts AOIG to PV at end of 1997) |
| Total PV | 119.5 | | |
| Continuing value | | | 440.0 (26.4/(1.11 – 1.05): 26.4 growth at 5%) |
| PV of CV | 357.1 | | |
| OI for 1997 | <u>681.8</u> | | |
| | <u>1,158.4</u> | | |
| Capitalize at 11%: $V^{\text{NOA}} = 10,530$ | | | (same as in Box 15.1) |
| NFO = <u>228</u> | | | |
| $V^E = \underline{10,302}$ or \$72 per share | | | |

(b)

The two-stage growth model (14.6) incorporates short-term and long-term growth rates, G_2 and G_{long} :

$$V_{1996}^{NOA} = OI_1 \times \frac{1}{\rho_F - 1} \left[\frac{G_2 - G_{long}}{\rho_F - G_{long}} \right]$$

Calculating G_2 :

Cum-FCF OI for 1998 = normal income + abnormal income growth

$$= (1.11 \times OI_{1997}) + AOIG_{1998}$$

$$= (1.11 \times 681.8) + 77.8$$

$$= 834.6$$

$$G_2 = 834.6/681.8$$

$$= 1.224 \quad (22.4\%)$$

Set $G_{long} = 1.05$, the long-term growth rate forecasted by the analyst, yields a forward P/E of 26.4 to apply to expected operating income for 1997 of \$681.8, and a valuation of

$$V^{NOA} = \$17,975 \text{ million}$$

Why is this value greater than that in (a)? Because the two-stage growth model implies a *gradual* decay in the growth rate from the 22.4% in 1998 to the 5% in the (very) long term. So, for 2000 (well short of the very long run), the growth rate is expected to be still well in excess of 5%. In contrast, the analyst is forecasting a steeper drop off of the growth rate to 5% by 2000.

E15.6 Integrity of Pro Formas

(a)

(1) Net financial expenses are growing even though net financial obligations remain constant.

(2) Successive numbers for common equity are not reconciled by the stocks and flows equation: $\Delta CSE = \text{Comprehensive income} - \text{Net dividends}$

(3) Free cash flow does not obey the relation, $C - I = OI - \Delta NOA$.

(4) Successive net financial obligations do not obey the relation,

$$\Delta NFO = NFE - (C - I) + d.$$

In short, accounting discipline is lacking from the pro forma.

(b)

Sales are forecasted to grow at 6% per year. The forecasted asset turnovers are constant (at 2.0) and the RNOA is forecasted to be a constant 20% (on beginning NOA). So residual operating income must be forecasted to grow at the sales growth rate of 6%.

E15.7 Evaluating an Acquisition: PPE Inc.

The important point in this exercise is to calculate the effect of the proposed acquisition on the *per-share value* of PPE. As shareholders of the acquired firm are to share in the benefits of the merger, the division of the value added in the merger between PPE's shareholders and those of the acquired firm has to be calculated. The value added will depend on the value of the merged firm. The division of the value will depend on the relative shares in the value (which depend on the rate of exchange of shares in the acquisition).

(a)

To solve the problem proceed as follows:

1. Calculate the value of the equity of the merged firm at the end of Year 1.
2. Calculate the per-share value of the equity of the merged firm at Year 1.
3. Calculate the present value (at Year 0) of the per-share value of Year 1 plus the present value of the Year 1 dividend.
4. Compare the Year 0 per share value with that calculated without the acquisition (from the pro forma in the text: \$0.96).

Is per-share value added?

The following calculates the value of the merged firm at the end of the year 1 and the per-share value of the 220 shares in the new firm (steps 1 and 2):

| Year | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> |
|---------------------------------|---------------|----------|----------|----------|----------|----------|
| RNOA | | 7.16% | 8.46% | 9.92% | 21.30% | 21.31% |
| Residual operating income (11%) | | (4.90) | (3.10) | (1.27) | 11.59 | 12.30 |
| PV of ReOI to Year 5 | 1.63 | | | | | |
| Continuing value, Year 5 | | | | | 246.0 | |
| PV of CV | 162.05 | | | | | |
| Net operating assets, Year 1 | <u>127.50</u> | | | | | |
| Value of NOA, Year 1 | 291.18 | | | | | |
| Value of NFO | <u>5.71</u> | | | | | |
| Value of equity | <u>285.47</u> | | | | | |
| Value per share (220 shares) | 1.298 | | | | | |

$$\left[CV = \frac{12.30}{1.11 - 1.06} \right]$$

Note that the ReOI is growing at 5% per year after Year 5.
(Calculations use a 11% required return for operations.)

The Year 0 per share value to PPE's shareholders (step3) is

| | |
|-----------------------|----------------|
| Value at Year 1 | \$1.298 |
| Dividend at year 1 | <u>0.038</u> |
| Year 1 pay off | 1.336 |
| PV at Year 0 (1.1134) | <u>\$1.200</u> |

[The discount rate for PPE pre-acquisition is used.]

The value of a PPE share without the acquisition is \$0.96, so the proposed acquisition adds value.

(b)

The revised pro forma, without amortization of goodwill, excludes the amortization expense in the income statement and maintains goodwill in the balance sheet:

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Income Statement | | | | | | |
| Sales | 131.15 | 189.00 | 200.34 | 212.36 | 225.10 | 238.61 |
| Core expenses | <u>120.86</u> | <u>168.87</u> | <u>179.00</u> | <u>189.74</u> | <u>201.13</u> | <u>213.19</u> |
| Operating income | <u>10.29</u> | <u>20.13</u> | <u>21.34</u> | <u>22.62</u> | <u>23.97</u> | <u>25.42</u> |
| Balance Sheet | | | | | | |
| Net operating assets | 127.50 | 133.17 | 139.18 | 145.55 | 152.30 | 159.46 |
| Net financial obligations | <u>5.71</u> | | | | | |
| Common equity | <u>121.79</u> | | | | | |

(c)

Calculate forecasts of residual operating income (ReOI) for the alternative pro forma and value the operations from those forecasts.

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|------------------|--------|--------|--------|--------|--------|--------|
| ReOI | | 6.105 | 6.691 | 7.310 | 7.960 | 8.667 |
| ReOI growth rate | | | 9.60% | 9.25% | 8.89% | 8.86% |

The ReOI growth rate is declining each year, but is not in steady state. Sales and operating income are growing at 6%, as in part (a), but the book values of NOA are not. However, the book values will eventually converge to the 6% sales growth rate. You need a computer: Input the pro forma into a spreadsheet and continue computations for years after Year 6:

- Grow operating income at 6% per year
- Calculate the free cash flow each year from either pro forma: $FCF = OI - \Delta NOA$. (Free cash flow does not change with the changed accounting, of course, so will be the same when calculated from either pro forma.)

Appreciate that free cash flow grows at a 6% rate. So, as FCF is \$18.26 for Year 6, subsequent FCF can be extrapolated at 6%.

- Calculate NOA each year as $NOA_t = NOA_{t-1} + OI_t - FCF_t$
- Calculate ReOI and present value it
- Add NOA at the end of Year 1 to get the value of operations at that point.

This Year 1 value is the same as that in part (a) (the accounting does not affect the value!), the value at Year 0 is also the same.

E15.8 Comprehensive Analysis and Valuation Exercise

Part I

(a)

Compensation expense = $12/0.35 = 34$

Tax benefit 12

Compensation expense, after tax 22

(b)

| | |
|--------------------------------------|--------------------|
| Market price of shares repurchased | 25 |
| Amount paid for shares: 720/24 mill. | <u>30</u> |
| Loss per share | 5 |
| Number of shares | <u>24</u> million |
| Total loss | <u>120</u> million |

(These losses are not tax deductible)

(c)

Comprehensive income statement

| | | |
|--------------------------------|----------------|------------|
| Sales | 3,726 | |
| Operating expenses | <u>(3,204)</u> | |
| OI before stock compensation | 522 | |
| Stock compensation | <u>(22)</u> | |
| Operating income | 500 | |
| Interest expense | 98 | |
| Interest income | <u>(15)</u> | |
| | 83 | |
| Tax benefit | <u>29</u> | |
| | 54 | |
| Unrealized gain on investments | (50) | |
| Put option losses | <u>120</u> | <u>124</u> |
| <u>Comprehensive income</u> | | <u>376</u> |

(d)

| | 2002 | 2001 |
|-----------------------------|--------------|--------------|
| Net operating assets | 3,160 | 2,900 |
| Net financial obligations | <u>1,290</u> | <u>1,470</u> |
| Common shareholders' equity | <u>1,870</u> | <u>1,430</u> |

Financial leverage (FLEV) = $1,290/1,870 = 0.690$

Operating liability leverage (OLLEV) = $1,590/3,160 = 0.503$

(Operating liabilities = 1,200 + 390 = 1,590)

(e)

$$\begin{aligned} \text{FCF} &= \text{OI} - \Delta \text{NOA} \\ &= 500 - (3,160 - 2,900) \\ &= 240 \end{aligned}$$

Part II

(a)

$$\begin{aligned} \text{RNOA} &= \text{PM} \times \text{ATO} \\ &= 14\% \times 1.25 \\ &= 17.5\% \end{aligned}$$

(b)

$$\begin{aligned} \text{ReOI}_{2003} &= (0.175 - 0.09) \times \text{NOA}_{2002} \\ &= (0.175 - 0.09) \times 3,160 \\ &= 268.6 \end{aligned}$$

(c)

$$\begin{aligned} V^E &= \text{NOA}_{2002} + \text{ReOI}_{2003}/(\rho_F - g) - \text{NFO} \\ &= 3,160 + 268.6(1.09 - 1.06) - 1,290 \\ &= 10,823 \end{aligned}$$

(Growth rate in ReOI is the sales growth rate because ATO is constant)

(d)

Method 1:

| | |
|----------------------------------|---------------|
| OI ₂₀₀₄ | 586.18 |
| FCF ₂₀₀₃ , reinvested | <u>32.71</u> |
| | 618.89 |
| Normal OI | <u>602.77</u> |
| AOIG | <u>16.12</u> |

Method 2:

AOIG = growth in ROI

$$\begin{aligned} AOIG_{2004} &= 268.6 \times 0.06 \\ &= 16.12 \end{aligned}$$

(OI and NOA both grow at 6%)

(e)

$$\begin{aligned} V_{2002}^E &= \frac{1}{0.09} \left[OI_{2003} + \frac{AOIG_{2004}}{\rho_F - g} \right] - NFO \\ &= \frac{1}{0.09} \left[553 + \frac{16.12}{1.09 - 1.06} \right] - 1,290 \\ &= 10,825 \end{aligned}$$

$$(OI_{2003} = 3,160 \times 0.175 = 553)$$

(f)

| | | |
|------------------------------|------------|---------------|
| V^E before option overhang | | 10,823 |
| Option overhang: | | |
| Value of outstanding options | | |
| 28 mill x 15 | 420 | |
| Tax benefit (35%) | <u>147</u> | <u>273</u> |
| Adjusted valuation | | <u>10,550</u> |

(g)

| | | |
|---------------------------------------|-----------|------------|
| Forecast of operating income for 2003 | | 553 |
| Forecasts of net financial expense: | | |
| NFO x NBC = 1,290 x 0.056 | 72 | |
| Tax benefit (at 35%) | <u>25</u> | <u>47</u> |
| Forecast of comprehensive income | | <u>506</u> |

Minicases

M15.1. Sensitivity Analysis, Valuation, and Strategy: Dell

Computer

The purpose of this case is to translate the analysis of Minicase M12.1 into a valuation and to raise a discussion of what might justify the seemingly high valuation for Dell based on its current operating strategy. Is Dell overpriced or do reasonable scenarios justify the valuation?

Work this case only if students have done the earlier Dell case: they will need the insights from that case to proceed.

Refer to the solution to Minicase M12.1 in Chapter 12, particularly the reformulated statements. Pertinent numbers are summarized here:

| | 1999 | 1998 | 1997 | 1996 |
|--|-------|-------|------|------|
| Operating income | 1,434 | 896 | 514 | 268 |
| Average NOA | (421) | (374) | 111 | 352 |
| Residual operating income (cost of capital = 16%) | 1,502 | 956 | 496 | 212 |
| Growth in residual operating income | 57% | 93% | 134% | 49% |
| Core residual operating income | 1,502 | 970 | 492 | 212 |

The core residual operating income for 1999 is calculated on negative net operating assets: $\text{ReOI}_{1999} = 1,435 + (0.16 \times 421) = \$1,502$ million.

Question A

Value at current core OI level:

$$V = \text{CSE} + \frac{\text{Core Re OI}_{1999}}{0.16}$$

$$= \$2,321 + \frac{\$1,502}{0.16}$$

$$= \$11,709 \text{ or } 4.60 \text{ per share}$$

One might look at the sensitivity of this valuation to the cost of capital estimate. Also the valuation should be adjusted for anticipated exercise of employee stock options. But clearly the market sees a lot of growth to justify a price of \$38 per share.

Question B

Implied growth in ReOI at \$38 per share

$$\text{Market value} = \text{Book value} + \frac{\text{ReOI}_{1999} \times g}{p - g}$$

$$96,634 = 2,321 + \frac{1,502 \times g}{1.16 - g}$$

$$g = 1.1418 \text{ or } 14.2\% \text{ growth rate per year in perpetuity}$$

At current after-tax core profit margins of 7.9% and net operating assets at the current negative level of \$400, sales would have to grow at an annual rate of 14.2% perpetually, or even more if anticipated loss of value from exercise of stock for compensation were factored in.

Question C

Questions regarding the current business:

- Can Dell maintain such a sales rate? Will competitors erode Dell's market?
- What will be the total size of the market, and its growth?
- Can Dell maintain profit margins at the 1999 level?
- Can Dell continue to work with negative net operating assets?
- Will Dell's low advertising catch up with it?
- What do fade diagrams predict will happen? Is Dell a firm that will not follow the typical pattern?

You can continue with a sensitivity analysis:

- What will be the effect on the value of sales growth of less than 14.2%, say 12%?
- What will be the effect of margins declining by 1%?
- What will be the effect of new business requiring investment in positive NOA?

The valuation looks high for the current business. Is there value in other strategies that Dell might pursue?

Strategy Questions:

- Can Dell generate value in alternative lines of business?
- Can Dell use its brand name for other businesses?
- Can Dell use its distribution channels for other business?
- Does Dell have an internet strategy that can lever other business through its internet sales site?
- Does Dell have “real options” that are not captured by this analysis?
- Is Dell a take over target?
- Can Dell use its (overpriced?) shares to make an acquisition cheaply?

The answers to some of these questions may not be clear. But the questions do indicate what the investor is speculating on in buying the stock: if he sees declining sales growth rates or declining margins, there must be other reasons for buying the stock.

M15.2. Tracking Nike and Reebok

This case rounds off the student's experience with the Nike and Reebok throughout the text. Students should be familiar with the analysis of the two firms from 1994 – 1996 in Chapters 11 and 12 and will have conjectured about the valuations using simple forecasting in the last two chapters.

At this point, students may have also looked into to analysis and valuation Roadmap in **BYOAP** on the web site where Nike data from 1996 - 2000 is used as an example. This case might be covered in conjunction with helping students to develop spreadsheet tools, using the Roadmap as a guide. The Roadmap is self-guiding so, alternatively, the instructor can refer students to the Roadmap after working this case. It is important at this stage that the student feels “hands on.”

The case asks the student to track Nike and Reebok through to 1999 and to understand how the drivers have changed. This gives a sense of how drivers can change for individual firms, in contrast to the fade diagrams for a prototype typical firm. With the added history, the student feels more comfortable in making a valuation, but is left with some speculation in reconciling that valuation to the market price (particularly for Nike). Is the analysis missing something or is the market mispricing the shares?

Question A: Tracking the Drivers

The driver history is laid out as follows. Calculations use average balance sheet amounts.

| NIKE | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 |
|---|---------|---------|---------|---------|---------|-------|
| Sales growth | -8.1% | 4.0% | 42.0% | 35.9% | 25.6% | --- |
| Gross margin ratio | 37.4% | 36.5% | 40.1% | 39.6% | 39.8% | 39.3% |
| Advertising/sales | 11.2% | 11.8% | 10.6% | 9.9% | 10.4% | 9.8% |
| General expenses/sales | 16.5% | 15.6% | 14.4% | 15.4% | 15.6% | 16.4% |
| Effective tax rate on core operating income | 39.5% | 38.8% | 38.6% | 38.5% | 38.4% | 39.1% |
| Core operating PM | 5.9% | 5.5% | 9.2% | 8.8% | 8.5% | 7.9% |
| Asset turnover (ATO) | 2.47 | 2.90 | 3.23 | 2.66 | 2.65 | --- |
| Core RNOA | 14.6% | 16.0% | 29.8% | 23.3% | 22.6% | --- |
| Core ReOI (11%) (millions) | \$127.7 | \$166.2 | \$534.8 | \$299.3 | \$207.6 | --- |

Comments:

From a high in 1997 and 1996, residual income subsequently declined, consistent with fade diagrams. Core profitability, margins and turnover also declined, and sales growth declined significantly (and was negative in 1999). The decline in core profit margins was driven largely by a drop in gross margins, although general expenses also increased as a percentage of sales.

Nike's stock price was unchanged from 1996 to 1999. But there was a loss of market value to shareholders: if the 1996 price of \$104 had increased at the required return for equity (say, 12%), the price would have been \$146 in 1999 before dividends, or \$73 adjusted for the split. The price stagnation is reflected in the declining financial statement measures.

REEBOK

| | 1998 | 1997 | 1996 | 1995 | 1994 |
|---|----------|---------|---------|----------|-------|
| Sales growth | -11.5% | 4.7% | 0.0% | 6.1% | 13.3% |
| Gross margin ratio | 36.8% | 37.0% | 38.4% | 39.3% | 40.0% |
| Advertising/sales | 4.5% | 4.5% | 5.8% | 4.5% | 5.0% |
| General expenses/sales | 27.9% | 24.9% | 24.9% | 24.3% | 22.2% |
| Effective tax rate on core operating income | 34.5% | 19.9% | 35.1% | 36.1% | 36.9% |
| Core operating PM | 2.9% | 6.2% | 4.9% | 6.7% | 8.1% |
| Asset turnover (ATO) | 2.85 | 3.17 | 2.95 | 2.98 | --- |
| Core RNOA | 8.4% | 19.6% | 14.5% | 19.9% | --- |
| Core ReOI (11%) (millions) | \$ -29.4 | \$ 98.7 | \$ 42.4 | \$ 103.6 | --- |

Comments:

Most of Reebok's drivers fade from 1995 onwards, driven by zero or negative sales growth and declining gross margins. Accordingly, residual operating income fades, and (on a core RNOA of only 8.4%) is negative in 1998. The "blip" in 1997 is due largely to a low effective tax rate that was transitory. (The low taxes in 1997 were due to the recognition of a \$40 million benefit from a tax deduction that had been in dispute with the IRS since 1992. This item could be taken out of core income.)

Reebok's stock price declined dramatically: at a price of \$43 in 1996 one would have expected it to rise to \$60 (before dividends) if the required return on equity is 12%. The decline is justified by the financial statements: expectations in 1996 based on the financials at that time surely would have been revised downwards by 1999.

Question B: Forecasting from trends

A thorough forecasting would consider more information than the history here. But the numbers here are a starting point and from there the analyst can go through some sensitivity analysis. The numbers for 1997 – 99 certainly lower the growth projections that one might have had in 1996 (and which were entertained in the text). A first stab at Nike might be a sales growth rate of 2% and a constant RNOA of 15% and a constant asset turnover (an SF3 forecast). Reebok is more difficult. Will its profitability (at 8.4% in 1998) recover to above 11%? The sales growth rate is critical; will sales recover? For nine months ended September 30, 1999, sales were \$2,277 million (down from \$2,519 in 1998) or \$3,036 million annualized. Reebok is not growing sales. (For the first six months of fiscal 2000,

ended November 30, 1999, Nike's sales were running at an annualized level of \$9,122 million.)

Question 3: Valuation

A set of valuations can be generated for each forecasting scenario. The following use the forecasts in part (b).

Nike:

$$\begin{aligned}\text{Value of equity} &= 3,335 + \frac{127.7 \times 1.02}{1.11 - 1.02} \\ &= \$4,782 \text{ million or } \$16.90 \text{ per share}\end{aligned}$$

At a price of \$52, the market sees considerably more growth or enhanced margins and turnover. Suppose we forecasted growth at 5% on an RNOA of 20%:

$$\begin{aligned}\text{Value of equity} &= 3,335 + \frac{(0.20 - 0.11) \times 3,553}{1.11 - 1.05} \\ &= \$8,665 \text{ or } \$30.69 \text{ per share}\end{aligned}$$

Using a required return of 9% would give a valuation of \$46.42 per share. These valuations (based on fairly optimistic scenarios, given the history) are below the market price.

Reebok:

If Reebok were to return to an operating profitability of 11% (equal to the assumed required return, it should trade at book value, that is, at \$54 million or \$9.26 per share. If the required return is 9% and the RNOA is 11%, then with no growth

$$\begin{aligned}\text{Value of equity} &= \$524 + \frac{(0.11 - 0.09) \times 1,102}{0.09} \\ &= \$769 \text{ million, or } \$13.58 \text{ per share.}\end{aligned}$$

These valuations are based on reasonable forecasts of the two businesses as they are.

The difference between the valuations and the market price might be explained by more speculative ideas:

- Are the firms a takeover target?
- Do they have an unrevealed strategy to change the nature of the business?
- Can they use their brand names in other lines of business?
- Will additional promotion reverse trends?

Or, are these firms (particularly Nike) mis-priced?

Follow subsequent events: did the stock prices increase or decrease?

Question D: Key Drivers

Be sensitive to sales growth (or lack of it). Be sensitive to the decline in margins (and possible recovery). These are the two key drivers.

M15.3. Exploring Strategic Options: Borders Group

Introduction

The case traces the experience of a once “hot stock.” The superstore concept was highly valued in 1998, giving Borders a share price of \$40. But enthusiasm for it declined with the reporting of actual results, so Borders stock had declined to \$11 by March 2000. The student is required to show how the loss of market value is reflected in the fundamentals. What features in the financial statements from 1998 to 2000 indicate that the valuation should be revised downward? If a strategic concept is to add value, it must promise added sales growth, higher margins, or higher asset turnovers. On which dimension did Borders fail? Borders experience can be compared with Home Depot’s success in Minicase 14.1 in Chapter 14.

The case also illustrates that value from a good business concept can be eroded away by competition from an alternative concept and failure to adapt quickly to that competition. Internet retailing of books and records challenged Borders, and Borders was slow to react. By 2000 they had a very small share of sales on the Internet.

The setting for the case is a press release in which management try to “talk up the stock.” So class discussion might involve how one talks up the stock price. Management felt that the stock was undervalued. Were they jealously viewing the generous multiples of other firms in the bubble market at the time and applying the method of comparables?

Preliminaries

To get things going, reverse engineer. Calculate the implicit growth in residual operating income that is implied by the market price of \$11 in February 2000.

Market value = $\$11 \times 77.2$ million shares outstanding = \$849 million

$$\text{Core operating residual income for 2000} = 111.2 - (0.11 \times 881.9) = \$14.191$$

million

This ReOI is calculated using a cost of capital for operations of 11% applied to beginning-of-year net operating assets. The implicit growth in ReOI is given by solving for g :

$$849 = 704 + \frac{14.191 \times g}{1.11 - g}$$

thus, $g = 1.002$ (or a 0.2% annual growth rate). (The \$704 million for common equity is the number estimated in the note under the balance sheets in the case.)

One could calculate the sensitivity of this estimate to assumptions about the cost of capital. Beta services gave Borders an equity beta of 1.55 at the time. With relative low financial leverage (0.233), this beta indicates that the market sees Borders operations as considerably risky.

The (close to) zero growth rate says that the market expects residual operating income to continue in the future at the level in 2000. That is, it implicitly has an SF2 forecast in mind for the operations. (And, accordingly, it sees the unlevered P/E ratio as normal: see Chapter 16). With their statement that the stock is undervalued, management are saying that they expect growth in residual operating income rather than zero growth. Accordingly, they are expecting improvement in the drivers from fiscal 2000.

Now look at the historical growth, and its drivers.

| | 2000 | 1999 | 1998 | 1997 |
|--|--------|--------|--------|-------|
| Core residual operating income (11%) (\$ million) | 14.191 | 19.712 | 20.130 | 1.811 |
| RNOA | 12.6% | 13.6% | 14.4% | 11.3% |
| Core operating profit margin | 3.7% | 3.9% | 3.7% | 3.2% |
| Asset turnover | 3.38 | 3.46 | 3.86 | 3.56 |
| Growth rate for sales | 14.9% | 14.5% | 15.7% | --- |
| Gross margin ratio | --- | 28.3% | 27.9% | 26.6% |
| SG & A ratio | --- | 21.5% | 21.4% | 20.9% |
| Core operating income before tax PM | 6.1% | 6.4% | 6.1% | 5.3% |

Question A

Borders stock price of \$40 in July 1998 was on a 1998 residual operating income of \$20.130 million. The implied growth (for a market value of \$3.016 billion on 75.4 million shares) is

$$3,016 = 598 + \frac{20.130 \times g}{1.11 - g}$$

thus, $g = 1.101$ (or a 10.1% annual growth rate).

It is clear that, in revising the price from \$40 in July 1998 to \$11 in March 2000, the market revised its growth estimate down --- from 10% (by the calculations here) to 0%.

And it is clear that the growth was not delivered in the financials for 1999 and 2000. Core ReOI was \$19.712 million in 1999, but it dropped to \$14.191 million in 2000, with RNOA dropping from 14.4% to 12.6%. Margins persisted at the (relatively low) rate of 3.7%, but it is the decline in the asset turnover that tells the story. The superstore concept was expected to draw customers. With this draw and a large expansion of the number of superstores, sales were anticipated to grow. And

grow they did. But the sales growth did not produce higher asset turnover: the sales required additional investment, but this investment did not increase sales per dollar invested. (In retail terms, it did not increase sales per square foot.) This translates into an ReOI that did not increase; as the NOA are charged at the required return, turnovers have to increase in order to increase ReOI if profit margins are constant. In other words, the operational efficiency ratio has to increase:

$$\text{ReOI} = \text{Sales} \times [\text{PM} - \text{Operational Efficiency Ratio}]$$

Borders operational efficiency ratio $\left(\frac{\text{required return}}{\text{ATO}} \right)$ declined over the period.

One can ask “what if” questions as to how the ReOI would have changed if the ATO had increased to higher levels (say 4.0) or profit margins had increased.

Question B

The pricing of Borders comes down to projections of growth in sales, translated into margins and turnovers. The market, with its SF2 valuation, sees no change over 2000. The management would have to persuade investors that its superstore concept will finally take off and/or its Borders Online e-commerce operation will generate turnover. That business is very competitive, and increasing margins is hard to do, so growth probably has to come from sales and asset turnover. Barnes & Noble, the most similar operation to Borders, was reporting lower margins than Borders at the time.

There is not enough information given in the case to value Borders. One needs to develop full pro formas to do so. But, when we don't have full information, we carry out sensitivity analysis that for alternative scenarios. As a start, calculate the value as if ReOI were to return to the level of 1999, applying an SF2 forecast:

$$\text{Value of equity} = 704 + \frac{20.130}{0.11}$$

= \$887 million, or \$11.50 per share.

For a further sensitivity analysis, calculate the value for a 1%, 2% or 3% growth rate.

What would produce these growth rates? Also, look at sensitivity to the required return.

In March 2000, analysts were forecasting eps of 1.51 for fiscal year 2002 and 1.68 for 2003. Students could work with these (short-term) forecasts to get a rough valuation.

Question C

If management considers the stock to be under-priced, they might well try to communicate the reasons why. How do they plan to increase margins or turnover: sales growth alone is not sufficient. Can they convince the market that the superstore concept is indeed a sound one? Can they convince the market that they can generate value through internet sales? (They were making losses on the Internet operation in fiscal 2000.)

In early 2000, many stocks appeared to be overvalued, particularly those associated with e-commerce. Was Borders (who had an emerging internet business) complaining about its relative valuation?

The options listed in the case:

(a) Mergers can increase value – either as an acquirer or an acquiree. But what is the scenario, the operational strategy to justify a value-generating merger? If Borders were indeed undervalued, would it not get an unfavorable rate of exchange in a share transaction? Indeed, making acquisitions with undervalued shares loses value for shareholders. And offering oneself for sale as an acquiree when the shares are cheap also loses value for shareholders. There is a contradiction in saying that the shares are undervalued and that a merger might solve the problem. Of course Borders could use

cash in a merger if it is the acquirer. Can it, then, convince the bankers that there is value in the firm against which to lend?

(b) A buyout makes sense if the shares are undervalued. Management can generate value for shareholders by buying the shares cheaply. Indeed the very announcement of a buyout might be interpreted as a signal of under-valuation and increase the stock price. But, of course, this strategy assumes that some shareholders can be persuaded to sell their shares cheaply (if they are indeed cheap).

(c) Internet shares were getting very high valuations at the time and some firms were spinning off .com operations or issuing tracking stock on these operations to get the higher valuations. But might such a spinoff damage Borders' overall strategy – of being a market place with a number of distribution channels? And were the high valuations of .com stocks just a fad?

Another issues to discuss:

- Are the amortizations of goodwill appropriate? If Borders overpaid for its acquisitions (of Walden Books), should not the cost of the purchase be written off?

Postscript

Borders' stock price increased from \$11 to \$15 $\frac{1}{2}$ after the report that Borders was considering "strategic options." Apparently the market was impressed with the thinking and considered the stock to be undervalued.

Borders put itself up for sale later in 2000 (at the higher price). But no satisfactory offer materialized. According to a report in the *Wall Street Journal*, a shareholder group then asked the company to change its bylaws to ensure the officers "devote full time and attention to the business." It also criticized Borders execution of its internet strategy, contrasting it to Barnes & Noble which had pursued strategic

alliances with Bertelsman AG with its web strategy. In April 2001, Borders announced it was getting out of the online book selling business, essentially handing it over to Amazon.com with a promise of commissions from customer referrals.

M15.4. Evaluating a P/E Ratio: Procter & Gamble

Introduction

This case examines a successful consumer products company (in the past) that was renowned (in the past) for product innovation, sales and earnings growth. But, despite a continuing large R&D program, sales growth and worldwide market

share had declined, with sales growth in 1999 of only 2.6% and eps growth in the same year of only 0.4%. Yet the market priced the firm at a multiple of over 35 times earnings. This multiple, benchmarked against a normal P/E for the firm of 10.1, implies considerably higher growth rates in the future; the normal P/E of 10.1 is based on a cost of capital for equity of 11% and implies that earnings will grow, cum dividend, at the required rate.

Strategy for Growth

Durk Jager set to shake up the company with the following three strategies: (1) streamlining the R&D program with a focus on innovation and bringing new products to market faster, (2) focusing on brand marketing and connecting customers to brands, and (3) cost cutting through reorganization. Overriding was the need to cut through an in-bred, slow moving corporate culture. These were ambitious goals. Shaking up a large, successful company is difficult and some argued that he was moving too quickly on too many fronts. But the question of growth really depended on the success of the new strategies.

The case calls for the student to model the P/E ratio appropriately and examine the question of whether a P/E of 35 is warranted. On the basis of the historical data, the P/E looks high.

Start by preparing the reformulated financial statements

Reformulated Income Statements

| | 1999 | 1998 | 1997 | 1996 | 1995 |
|--|--------|--------|--------|--------|--------|
| Net sales | 38,125 | 37,154 | 35,764 | 35,284 | 33,482 |
| Cost of products sold | 21,206 | 21,064 | 20,510 | 20,762 | 19,561 |
| Marketing costs | 3,538 | 3,704 | 3,466 | 3,254 | 3,284 |
| Research and development | 1,726 | 1,546 | 1,469 | 1,399 | 1,304 |
| Other operating costs | 5,017 | 4,785 | 4,831 | 5,054 | 5,089 |
| Core operating income before tax | 6,638 | 6,055 | 5,488 | 4,815 | 4,244 |
| Tax on operating income | 2,233 | 2,056 | 1,922 | 1,677 | 1,445 |
| Tax on unusual charge | 139 | | | | |
| Core operating income after tax | 4,266 | 3,999 | 3,566 | 3,138 | 2,799 |
| (A tax rate of 36% is used to allocate taxes between unusual and core income.) | | | | | |
| Net income | 3,763 | 3,780 | 3,415 | 3,046 | 2,645 |
| Basic eps | \$2.75 | \$2.74 | \$2.43 | \$2.14 | \$1.85 |
| Basic eps before unusual charges | \$3.04 | \$2.74 | \$2.43 | \$2.14 | \$1.85 |
| Some ratios: | | | | | |
| Sales growth | 2.6% | 3.9% | 1.4% | 5.4% | |
| Gross margin | 44.4% | 43.3% | 42.7% | 41.2% | 41.6% |
| Margin after marketing costs | 35.1% | 33.3% | 33.0% | 31.9% | 31.8% |
| Core profit margin | 11.2% | 10.8% | 10.0% | 8.9% | 8.4% |
| Core RNOA | 23.3% | 25.1% | 24.7% | 21.3% | 20.7% |
| Residual earnings (11%) | 2,625 | 2,647 | 2,314 | 2,028 | 1,789 |
| Residual core operating income (9%) | 2,623 | 3,072 | 2,665 | 2,305 | 2,099 |

(Average balance sheet amounts used)

Reformulated Balance Sheets

| | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Operating assets | 29,313 | 28,560 | 24,434 | 25,210 | 25,947 | 22,879 |
| Operating liabilities | <u>10,674</u> | <u>10,684</u> | <u>10,506</u> | <u>10,222</u> | <u>11,405</u> | <u>10,348</u> |
| Net operating assets | 18,639 | 17,876 | 13,928 | 14,988 | 14,542 | 12,531 |
| Net financial obligations | <u>8,362</u> | <u>7,461</u> | <u>3,741</u> | <u>5,152</u> | <u>5,866</u> | <u>5,641</u> |
| Common equity | <u>10,277</u> | <u>10,415</u> | <u>10,187</u> | <u>9,836</u> | <u>8,676</u> | <u>6,890</u> |
| | | | | | | |
| Average NOA | 18,258 | 15,902 | 14,458 | 14,765 | 13,537 | |
| Average NFO | 7,912 | 5,601 | 4,447 | 5,509 | 5,754 | |
| Average CSE | 10,346 | 10,301 | 10,012 | 9,256 | 7,783 | |
| | | | | | | |
| FLEV | 0.765 | 0.544 | 0.444 | 0.595 | 0.739 | |

Question A

The dividend-adjusted P/E ratios for each year are calculated as

$$P/E = \frac{\text{Price per share} + \text{dps}}{\text{eps}}$$

| | <u>1999</u> | <u>1998</u> | <u>1997</u> | <u>1996</u> | <u>1995</u> |
|-----------------------|-------------|-------------|-------------|-------------|-------------|
| Dividend-adjusted P/E | 36.1 | 26.3 | 27.1 | 22.8 | 19.3 |

Question B

Calculate forecasted growth in eps from analysts' forecasts:

| | <u>After 2001</u> | <u>2001</u> | <u>2000</u> | <u>1999A</u> | <u>1998A</u> | <u>1997A</u> |
|---|-------------------|-------------|-------------|--------------|--------------|--------------|
| g | 13.0% | 13.7% | 17.1% | 0.4% | 12.8% | 13.6% |

Use a forecasted growth of 13% in the formula:

$$P/E = \frac{1.13}{1.11 - 1.13}$$

The denominator is negative!

This is a poor model because it won't work for growth rates greater than the cost of capital. For a normal P/E, we expect earnings to grow (cum-dividend) at the cost of capital (giving a zero denominator). For a P/E greater than normal (which Procter and Gamble has), we expect earnings to grow (cum-dividend) at greater than the cost of capital (giving a negative denominator). Note that ex-dividend growth rates don't make sense.

The abnormal earnings growth model in Chapter 16 provides a way of incorporating earnings growth. You might introduce this model at this point. The key is to think of growth as cum-dividend growth in earnings over the normal growth rate (given by the required return). See answer to Question D.

Question C

A normal P/E is based on the cost of equity capital (of 11% here):

$$\text{Normal P/E} = \frac{1.11}{0.11} = 10.1$$

This implies a growth in cum-dividend earnings per share of 11%. For P&G the forecasted eps for 2000 that is implied by a normal P/E, is:

$$\begin{aligned} \text{Forecasted eps for 2000} &= (1.11 \times 2.75) - (0.11 \times 1.14) \\ &= \$2.93 \end{aligned}$$

Analysts were forecasting 3.22 per share, implying a higher P/E than the normal of 10.1.

Question D

The current (dividend-adjusted) traded P/E (in 1999) was 36.1. This is considerably higher than the normal P/E of 10.1, implying considerable growth in eps.

Looking at past financial statements to challenge this multiple:

The past financial statements suggest a P/E closer to the 10.1 rather than the 36.1:

- (i) Sales growth is low, declining from (only) 5.4% in 1996 to 2.6% in 1999.
- (ii) Eps growth in 1999 was higher than the 11% cost of capital, after

adjusting for the unusual charge, but not by much:

| | |
|------------------------------------|-------|
| Eps in 1999 before the charge | 3.04 |
| Cum-dividend eps in 1999 | 3.15 |
| Eps growth from 1998, cum-dividend | 15.0% |

(Cum-dividend eps is $\text{eps (1999)} + [\text{dps (1998)} \times 0.11]$)

- (iii) The eps growth has been achieved partly by an increase in financial leverage: FLEV increased from 0.544 to 0.765 in 1999.

(iv) Growth in core operating income was only 6.7% (although this is not “dividend-adjusted” for reinvested free cash flow).

(v) Residual operating income was flat over the three years, 1997 – 1999, indicating no growth. This was due to a fairly constant core RNOA. With low anticipated sales growth (and thus low anticipated growth in net operating assets) it is difficult to see the residual operating income increasing in a way that justifies a multiple of 36.

Looking at core operating income growth:

Implicit in the discussion above, is a move from multiples of earnings to multiples of core operating income, and to a focus on growth in core operating income. This avoids the affect of leverage and the unusual charge in 1999. Can P&G grow residual operating income?

Looking at analysts’ forecasts:

Actual growth for 1998 and 1999 and analysts’ forecasted growth for 2000 to 2002 are as follows:

| | 2002E | 2001E | 2000E | 1999 | 1998 |
|-----------------------------|-------|-------|-------|--------|-------|
| Eps | 4.14 | 3.66 | 3.22 | 2.75 | 2.74 |
| Dps | 1.53 | 1.35 | 1.19 | 1.14 | 1.01 |
| Cum-dividend eps | 4.29 | 3.79 | 3.35 | 2.86 | 2.84 |
| Growth in eps, cum-dividend | 17.2% | 17.7% | 21.7% | 4.4% | 17.3% |
| Abnormal cum-div eps growth | 0.226 | 0.217 | 0.293 | -0.152 | |

Dps are forecasted assuming a payout of 37% of earnings (as in the past). Eps in 2002 is based on the forecasted 13% growth rate given by analysts. Abnormal eps growth (AEG) is cum-dividend earnings in excess of normal growth (ie, in excess of growth at required rate of return): $AEG = Eps(t) + (\rho - 1)dps(t-1) - \rho \cdot eps(t-1)$.

These growth rates suggest a higher P/E than the normal P/E. Analysts saw the future as improving on 1999 results, with positive abnormal eps growth of about 17% relative to the required rate of 11%. (The 1999 eps growth rate (cum-dividend) here is 4.4%, but the rate before the unusual charge was 15.0% (see above)).

P/E Models: The constant growth AEG model

The AEG model prices one year ahead capitalized earnings plus an addition for abnormal growth in cum-dividend earnings. From the analysts' pro forma,

$$\text{Expected cum-dividend earnings for 2001} = 3.66 + (0.11 \times 1.19) = 3.79$$

$$\text{Expected cum-dividend earnings for 2001 with normal growth} = 3.22 \times 1.11 = 3.57$$

$$\text{Expected abnormal earnings for 2001} = 3.79 - 3.57 = 0.22$$

If a constant growth rate is set at 4% (roughly the expected GDP growth rate, then

$$\text{Value} = (3.22 + 0.22/(0.11-0.04))/0.11$$

$$= 57.84 \text{ per share}$$

P/E Models: the two-stage AEG growth of Ohlson and Juettner

Combine short-term and long-term growth rates:

$$V_{1996}^{NOA} = OI_1 \times \frac{1}{\rho_F - 1} \left[\frac{G_2 - G_{long}}{\rho_F - G_{long}} \right]$$

$$\text{Expected cum-dividend earnings growth rate in 2001 } (G_2) = 3.79/3.22 - 1 = 0.177$$

$$\text{Value} = (3.22 \times (1 + (0.177 - 0.11)/(0.11 - 0.04)))/0.11 = 57.29$$

(Rounding error explains the difference between the two valuations.)

Students can examine how sensitive the valuation is to long-term growth rates different from 4% (and different estimates for the required return). Note that analysts are forecasting a growth rate in AEG of about 4% for 2002: from the pro forma, $0.226/0.217 = 1.041$ (or 4%). The \$57 value per share is considerably less than the market price of

\$98 and gives a current intrinsic P/E of 21 (or 19 before the unusual charge) and a forward P/E of 18.

Question E

The key to evaluating the P/E ratio is to forecast growth in residual operating income or growth in abnormal earnings growth. Clearly, this requires information on its drivers – sales growth, margins, etc. A critical issue is modeling the payoffs to Jager's business plan. That translates into watching closely the progress of the reorganization and the development of new brands. As much of the business plan focuses on products, brands and customers. Sales growth is the primary focus, followed up with margins from cost reduction and success of R&D.

Postscript

In the first quarter of 2000, P&G's stock price dropped from a high of \$118 per share in early January 2000 to \$56 on revenue disappointments. Analysts' forecasts for 2000 were revised down to \$3.09, about the same as that in 1999 (before the unusual charge). This price yielded a leading P/E of 18, more in line with the projections from the financial statements. Durk Jager resigned in June 2000 and the new management set about revising the business plan. Jager's plan (for growth) was deemed to have been a failure. As the market was pricing the growth in this plan, the price dropped. PG traded at \$68 in July 2001. Ex post, the sense of overvaluation here seems to be justified.

PG continued with repeated restructuring charges, totaling over \$2.0 billion from 1999-2001. After restructuring charges for seven quarters in a row up to 2Q, 2001, the company said that it expected to continue restructuring for the next three years up to 2004, for a total of about \$4 billion. With this frequency, these charges look very much like normal costs of doing business rather than unusual items. PG also got into the practice of including gains from sale of brands in core operating earnings.

M15.5 Profitability and Growth through Acquisitions and Goodwill Amortization: Quaker Oats

Introduction

This case examines how acquisitions affect profitability with purchase accounting, and raises the question of appropriate goodwill amortization.

Purchase accounting brings the acquired firm onto the acquirer's balance sheet at the purchase price, usually lowering a firm's return on net operating assets. Assets booked at fair value earn a normal RNOA (equal to the required return). So, if the NOA before the acquisition earned an RNOA greater than the required return, the RNOA will be weighted down (closer to the required return) as a result of the acquisition.

But the question is the effect on value. A firm has to cover the required return on the investment to generate residual income (and to add value from the acquisition). The analyst has to evaluate whether the firm has added value from the acquisition and, in doing so, has to ask whether amortization of the goodwill on the purchase is appropriate. Usually the analyst puts a lot of weight on short-term earnings and RNOA forecasts. If those forecasts are affected by arbitrary amortizations of goodwill, they may not be a good indication of earnings and profitability in the long run. The amortization issue is particularly pertinent if the firm overpaid for the purchase – as Quaker Oats apparently did for Snapple: too little amortization could make the acquisition look too profitable.

Accordingly, the case provides a vehicle to discuss the FASB's new acquisition accounting in Statements 141 and 142. The former disallows pooling accounting (in favor of purchase accounting, as here). The latter provides for an impairment alternative to straight-line amortization of goodwill. Does this accounting help the analyst in valuation?

The case also emphasizes the fallacy of “growth through acquisition.” Growth has to add value over what is paid for the acquisition. Other issues dealing with repeated divestitures and acquisitions, and with repeated restructurings, also arise in the case.

As always, work from reformulated statements, and use the reformulation to get insights into the structure of the business. Quaker Oats is in the core business of manufacturing and selling packaged foods. But the many gains and losses from sales of businesses in its income statements indicate that it is also in the business of buying and selling business. A firm can make money from selling products and from selling business that sell the products, and Quaker Oats does both. One could also argue that it is in the business of foreign exchange trading because it regularly reports foreign exchange losses in its income statement that might otherwise be hedged; it has chosen to expose its shareholders to exchange risk and its rewards. (See material in Chapter 18.)

Reformulation of the Financial Statements

The reformulated income statement below identifies these three components of operating income. Taxes are not allocated between the three because taxes on divestiture gains and losses are not reported in the footnotes. Effective reported tax rates (income taxes divided by income or loss before tax) vary a lot from year to year – over 40% in 1995 and 1996 but 26% - 29% in 1998 and 1999. Footnotes reveal that later years benefited from revisions in taxes over-assessed for the earlier years, so tax rates for any one year do not indicate the underlying rate.

QUAKER OATS CO

Reformulated Income Statements

| | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 |
|--|---------|---------|-----------|---------|---------|---------|---------|
| Net Sales | 4,725.2 | 4,842.5 | 5,015.7 | 5,199.0 | 5,954.0 | 6,211.1 | 5,730.6 |
| Cost of goods sold | 2,136.8 | 2,374.4 | 2,564.9 | 2,807.5 | 3,294.4 | 3,122.7 | 2,870.0 |
| Gross profit | 2,588.4 | 2,468.1 | 2,450.8 | 2,391.5 | 2,659.6 | 3,088.4 | 2,860.6 |
| Selling, general and administrative expenses | 1,904.1 | 1,872.5 | 1,938.9 | 1,981.0 | 2,358.8 | 2,553.9 | 2,302.3 |
| Operating income from core business, before tax | 684.3 | 595.6 | 511.9 | 410.5 | 300.8 | 534.5 | 558.3 |
| Operating income from trading businesses | 5.1 | (0.7) | (1,420.4) | 136.4 | 1,170.8 | 9.8 | 27.8 |
| Foreign exchange gains | (18.1) | (11.6) | (10.8) | (8.9) | (8.4) | (8.0) | (15.1) |
| | 671.3 | 583.3 | (919.3) | 538.0 | 1,463.2 | 536.3 | 571.0 |
| Restructurings and impairments | (12.7) | (127.8) | (65.9) | (23.0) | (117.3) | (118.4) | (48.3) |
| Reversal of restructuring charges | 9.9 | | | | | | |
| Operating Income | 668.5 | 455.5 | 985.2 | 515.0 | 1,345.9 | 417.9 | 522.7 |
| Tax reported | 163.3 | 112.1 | (133.4) | 167.7 | 496.5 | 127.3 | 180.8 |
| Tax benefit of net interest | 18.6 | 21.8 | 29.3 | 36.8 | 46.4 | 36.1 | 20.4 |
| Operating income | 486.6 | 321.6 | 881.1 | 310.5 | 803.0 | 254.5 | 321.5 |
| Net interest expense | 50.2 | 58.9 | 79.1 | 99.4 | 125.4 | 97.5 | 55.1 |
| Tax benefit (37%) | 18.6 | 21.8 | 29.3 | 36.8 | 46.4 | 36.1 | 20.4 |
| | 31.6 | 37.1 | 49.8 | 62.6 | 79.0 | 61.4 | 34.7 |
| Preferred dividends | 4.4 | 4.5 | 3.5 | 3.7 | 4.0 | 4.0 | 4.2 |
| Net financial expense | 36.0 | 41.6 | 53.3 | 66.3 | 83.0 | 65.4 | 38.9 |
| Net income (loss) | 450.6 | 280.6 | (934.4) | 244.2 | 720.0 | 189.1 | 282.6 |

Reformulated Balance Sheets

| | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Current assets, net of cash equivalents | 746.7 | 815.0 | 1,073.0 | 789.7 | 1,000.1 | 1,133.6 | 1,027.6 | 1,176.2 |
| Property plant and equipment, net | 1,106.7 | 1,070.2 | 1,164.7 | 1,200.7 | 1,167.8 | 1,214.2 | 1,228.2 | 1,273.3 |
| Intangible assets, net of amortization | 236.9 | 245.7 | 350.5 | 2,237.2 | 2,309.2 | 493.4 | 431.3 | 427.4 |
| Other assets | 94.4 | 127.8 | 106.0 | 131.7 | 135.0 | 162.1 | 88.8 | 83.0 |
| Operating assets | <u>2,184.7</u> | <u>2,258.7</u> | <u>2,694.2</u> | <u>4,359.3</u> | <u>4,612.1</u> | <u>3,003.7</u> | <u>2,775.9</u> | <u>2,959.9</u> |
| Operating liabilities | <u>1,306.9</u> | <u>1,406.0</u> | <u>1,431.5</u> | <u>1,583.9</u> | <u>1,759.6</u> | <u>1,566.4</u> | <u>1,443.9</u> | <u>1,382.3</u> |
| Net operating assets | 877.8 | 852.7 | 1,262.7 | 2,775.4 | 2,852.5 | 1,437.3 | 1,332.0 | 1,577.6 |
| Financial obligations | 680.5 | 701.7 | 1,034.7 | 1,545.5 | 1,773.2 | 991.5 | 780.9 | 735.5 |
| Shareholders' equity | <u>197.3</u> | <u>151.0</u> | <u>228.0</u> | <u>1,229.9</u> | <u>1,079.3</u> | <u>445.8</u> | <u>551.1</u> | <u>842.1</u> |

The repetitive restructuring charges make it difficult to calculate on-going core profitability. These charges are repetitive, so one can ask whether operating income from core business is consistently overstated, that costs that should otherwise be in operating expenses (such as depreciation) are recognized instead as supposed “one-time” restructuring charges. One also has to be concerned that estimated restructuring charges are overestimated, and “bled back” to increase operating income subsequently. Indeed there is an explicit reversal of a prior restructuring charge in 1999 (given in the note below the income statement). But the bleed back can also occur by reducing the depreciation base through restructuring charges, yielding lower depreciation expense in subsequent years. Quaker Oats’ restructuring reserve from the 1997 restructuring stood at \$32.6 million at the end of 1999, that from 1998 stood at \$23.6 million, and that from 1999 stood at \$7.4 million. Watch for reversals in the future.

Quaker Oats also announced further restructuring charges in 2000, in the range of \$175 million to \$225 million in the first quarter alone.

Question A

Firms can grow sales and assets through acquisitions, but, if they pay a fair price for the acquired firm, they may just earn a normal return on the acquisition and so may not add value. Indeed, they may lose value if, in their desire for growth, they pay too much for the acquisition. They will add value only if they purchase the acquired firm cheaply or if they add value in the combined operations.

Does acquiring other food packagers and their brands add value for Quaker Oats? They overpaid for Snapple, selling at a loss of \$1.4 billion in 1997 after acquiring it just two years before. Snapple was a “hot brand” in 1995, having gained shelf space widely in

grocery, convenience and drug stores. While there were some economies in including Snapple drinks in its distribution system, Quaker Oats overpaid for Snapple.

Question B

Here is an analysis of the profitability. Beginning balance sheet numbers are used in denominators.

| | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 |
|-------------------------------|-------|-------|--------|-------|-------|-------|-------|
| Core RNOA before tax | 80.3% | 47.2% | 18.4% | 14.4% | 20.9% | 40.1% | 35.4% |
| Core RNOA after tax | 50.6% | 29.7% | 11.6% | 9.1% | 13.2% | 25.3% | 22.3% |
| Gross margins | 54.8% | 51.0% | 48.9% | 46.0% | 44.7% | 49.7% | 49.9% |
| Core profit margin before tax | 14.5% | 12.3% | 10.2% | 7.9% | 5.1% | 8.6% | 9.7% |
| Core profit margin after tax | 9.1% | 7.7% | 6.4% | 5.0% | 3.2% | 5.4% | 6.1% |
| Asset turnover | 5.54 | 3.83 | 1.81 | 1.82 | 4.14 | 4.66 | 3.63 |
| Overall RNOA after tax | 57.1% | 25.5% | -31.7% | 10.9% | 55.9% | 19.1% | 20.4% |

After-tax numbers are calculated by applying a tax rate of 37% (because of the difficulty in allocating taxes between core and other components of operating income).

Core RNOA does not capture all the results of operations. We said above that Quaker Oats is in three lines of business and core RNOA measures only the results of the business of selling products. The average after-tax core RNOA over the seven years is 23.1%. The average of the after-tax RNOA from all activities – including gains from sales of businesses, restructuring charges and foreign exchange losses – is 22.5%.

The core RNOA may be overstated because what is really core expense is being charged as repetitive restructuring charges.

Question C

The core RNOA declines, not because of a decline in profit margins – they actually increased – but because the asset base is so much higher. The Snapple acquisition was accounted for as a purchase. So goodwill was recognized, increasing goodwill on the balance sheet from \$493.4 million in 1994 to \$2,309.2 million in 1995. Purchase accounting – unlike pooling accounting – puts an asset that firms have to cover with profits on the balance sheet. Thinking in terms of residual income, goodwill is an asset that is charged with the required return, so only income in excess of this charge is deemed to be value added. This is good thinking – and purchase accounting is good accounting – for firms have to cover the cost of their investment. Pooling accounting, on the other hand allows firms to give the appearance of increasing profits without the full amount of the assets they acquired appearing on the balance sheet. So residual income and RNOA may increase significantly, with no added value over the investment cost.

Question D

No. The value of the Snapple investment declined from \$1.7 billion to \$300 million over two years. If Quaker Oats had not sold Snapple, its carrying value would have been for in excess of its actual value.

Question E

Amortization expense is a legitimate expense if there is impairment of the goodwill. This will be the case when a firm overpays for an acquisition, as Quaker Oats did. Arbitrary amortization (using fixed rules, for example) can under or overestimate the impairment. So amortization can hinder valuation by giving a poor quality earnings number in the short run. If the firm charges excess amortization, short-term profitability will be depressed and not a good indicator of the long-run steady-state profitability. If the firm undercharges for amortization (because it overpaid for the acquisition, perhaps), the acquisition will look more profitable than it is. If the amortization over is 40 years, it may be a long time before that effect on earnings is removed.

The impairment rule is an alternative. FASB Statement 142 says that firms should amortize goodwill only if it has been impaired, that is, its value has declined; otherwise it is kept intact on the balance sheet. A good way to do this is to amortize the goodwill such that the expected residual income from the acquisition is zero. Accordingly, the goodwill on the balance sheet is always at its value, and is forecasted to earn an RNOA equal to the required return (and zero residual income). Goodwill cannot be written up, of course, so one will still forecast positive residual income from goodwill that has not been impaired, and thus get a good indication of the success of the acquisition.

Valuation under Statement 142 would, in principle, be more straightforward, for we would not have to be concerned about arbitrary amortizations affecting forecasted income in the short term that might reverse subsequently (after our forecast horizon). But can firms (and their auditors) we trusted to report unbiased impairments?

Question F

Quaker Oats' profitability increased after the Snapple debacle, and core RNOA before tax (and before restructuring charges) stood at 80.3% in 1999, with increasing gross margins. So the stock price rise appears justified.

But is a P/E multiple of 24 justified? Such a P/E requires considerable growth in residual income, either through increasing RNOA or growth in sales. It is unclear whether Quaker Oats can squeeze out more profitability. Sales are in decline. The only path to growth is acquisition – and acquisitions have to be paid for! It is hard to justify a P/E of 24 and the growth in residual earnings that it implies. Indeed, with 1999 being a year of particularly high profitability, one has to ask whether income is temporarily high so that the P/E ratio should be low.