CHAPTER ELEVEN

The Analysis of Profitability

Concept Questions

C11.1 The two rates of return will be the same in either of the following conditions:

(a) The SPREAD is zero, that is, return on net operating assets equals net borrowing cost.

(b) Financial leverage (FLEV) is zero, that is, financial assets equal financial obligations.

C11.2 The two rates of return will be the same in either of the following conditions:

(a) The operating liability leverage spread (OLSPREAD) is zero, that is, ROOA equals the implicit borrowing rate for operating liabilities.

(b) Operating liability leverage is zero, that is, the firm has no operating liabilities.

C11.3 (a) Positive

(b) Negative

(c) Negative

(d) It depends on whether the operating liability leverage spread is positive or negative

(e) Positive

(f) It depends on whether the operating spread is positive or negative

(g) Positive

Note: the advertising expense ratio (advertising/sales) might be high in the current period, producing a negative effect on ROCE. But the large amount of

advertising might produce higher future sales, so could be regarded as a positive value driver (and a positive driver of future ROCE).

C11.4 If the assets in which the cash from issuing debt is invested earn at a rate greater than the borrowing cost of the debt, ROCE increases: shareholders earn from the SPREAD.

C11.5 If a firm can generate income using the liabilities that are higher than the implicit cost that creditors charge for the credit, it increases its RNOA.

C11.6 Not necessarily. If the supplier charges a higher price for the goods to compensate him for financing the credit, buying on credit may not be favorable. The operating liability leverage created by buying on credit will be favorable if the return earned on the inventory is greater than the implicit cost the supplier charges for the credit.

C11.7 The first part of the statement is correct: A drop in the advertising expense ratio increases current ROCE. But a drop in advertising might damage share value as future ROCE might drop because of reduced sales.

C11.8 Return on common equity (ROCE) is affected by leverage. If a firm borrows, pays dividends, or makes a stock repurchase, it can increase its ROCE. But its return on operations (RNOA) may not change, or even decline. Always examine increases in ROCE to see if they are due to leverage.

C11.9 If the firm loses the ability to deduct interest expense for tax purposes, it does not get the tax benefit of debt and so increases its after-tax borrowing cost. Of course the firm also may find that creditors will charge a higher before-tax borrowing rate if it is making losses.

C11.10 The inventory yield is a measure of the profitability of inventory, the profit from selling inventory relative to the inventory carried. If gross profit falls or inventories increase, the ratio will fall.

C11.11 ROA mixes operating and financial activities. Financial assets are in the denominator and operating liabilities are missing from the denominator. Interest income is in the numerator. This calculation yields a low profitability measure, as the return on financial assets is typically lower than operating profitability and the effect of operating liabilities --- to lever up operating profitability --- is not included.

Exercises

E11.1 Leveraging Equations

(a) By the stocks and flows equation for equity

$$\begin{aligned}\text{net dividends} &= \text{earnings} - \Delta\text{CSE} \\ &= 207 - 300 \\ &= (93) \text{ (i.e. net capital contribution)}\end{aligned}$$

(This answer assumes no dirty-surplus accounting)

	2002	2003	Average
NOA	1,900	2,400	2,150
NFO	1,000	1,200	1,100
CSE	900	1,200	1,050

ROCE = 207/1,050 = 19.71%

Operating income (OI) = Sales – operating expense – tax on OI

= 2,100 – 1,677 – [106 + (0.34 x 110)]
= 279.6

RNOA = OI/ave. NOA = 279.6/2,150 = 13.0%

ROCE = [PM ×ATO] + [FLEV × (RNOA – NBC)]

PM = OI/Sales = 279.6/2,100 = 0.1331 (or 13.31%)
ATO = Sales/av. NOA = 2,100/2,150 = 0.9767
FLEV = Ave. NFO/av. NOA = 1,100/1,050 = 1.0476
NBC = Net interest expense/ave. NFO = (110 × 0.66)/1,100 = 6.6%

So,

19.71% = (0.1331 × 0.9767) + [1.0476 × (13.0% - 6.6%)]

(b)

	2002	2003	Average
Operating assets	2,000	2,700	2,350
Operating liabilities	(100)	(300)	(200)
NOA	1,900	2,400	2,150

Implicit interest on operating liabilities (OL) = 200 × 4.5%

= 9

Return on operating assets (ROOA) = (OI + Implicit interest)/ave. OA

= (279.6 + 9)/2,350

= 12.28%

Operating liability leverage = OL/NOA

$$= \frac{200}{2{,}150}$$

$$= 0.093$$

So,

$$13.0\% = 12.28\% + [0.093 \times (12.28\% - 4.5\%)]$$

(c) This is the case of a net creditor firm (net financial assets).

Net dividends = 339 – 700

= (361)

ROCE = 339/3,050 = 11.11%

Operating income = 2,100 – 1,677 – (174 – (0.34 × 90))

= 279.6 (as before)

RNOA = 279.6/2,150 = 13.0% (as before)

Return on net financial assets (RNFA) = Net financial income/ave. FA

$$= \frac{90 \times 0.66}{900}$$

= 6.6%

FLEV = -900/3,050 = -0.295

PM and ATO are as before.

So,

$$11.11\% = (0.1331 \times 0.9767) – [0.295 \times (13.0\% - 6.6\%)]$$

E11.2 First-level Analysis of Financial Statements

(a) First reformulate the financial statements:

Reformulated Balance Sheets

	2002	2001	Average
NOA	1,395	1,325	1,360
NFO	300	300	300

CSE	1,095	1,025	1,060

Reformulated Income Statement, 2002

Sales		3,295
Operating Expenses		3,048
		247
Tax reported	61	
Tax on NFE	9	70
OI		177
Net interest	27	
Tax on interest	9	
NFE		18
Comprehensive Income		159

$CSE_{2002} = CSE_{2001} + Earnings_{2002} - Net\ Dividends_{2002}$

$1{,}095 = 1{,}025 + 159 - 89$

Stock repurchase = 89

(b) $ROCE = \frac{159}{1{,}060} = 15.0\%$

$RNOA = \frac{177}{1{,}360} = 13.0\%$

$FLEV = \frac{300}{1{,}060} = 0.283$

SPREAD = RNOA – NBC

$= 13.0\% - 6.0\% = 7.0\% \left[NBC = \frac{NFE}{NFO} = \frac{18}{300} \right]$

C – I = OI - ΔNOA

= 177 – 70

= 107

(c) The ROCE of 15% is above a typical cost of capital of 10% - 12%. So one might expect the shares to trade above book value. But, to trade at

three times book value, the market has to see ROCE to be increasing in the future or investment to be growing substantially.

E11.3 Relationship Between Rates of Return and Leverage

(a) ROCE = RNOA + [FLEV × (RNOA – NBC)]

13.4% = 11.2% + [FLEV × (11.2% - 4.5%)]

FLEV = 0.328

(b) RNOA = ROOA + (OLLEV × OLSPREAD)

11.2% = 8.5% + [OLLEV × (8.5% - 4.0%)]

OLLEV = 0.6

(c) First calculate NFO and CSE using the financial leverage ratio ($\frac{NFO}{CSE}$) applied to the net operating assets of $405 million.

FLEV $= \frac{NFO}{CSE}$

NOA = CSE + NFO

So $\frac{NFO}{CSE}$ = 1 + FLEV

= 1.328

As NOA = $405 million

Then CSE $= \frac{\$405\text{ million}}{1.328}$

= $305 million

and NFO = $100 million

Now distinguish operating and financing assets and liabilities

OLLEV $= \frac{OL}{NOA} =$ 0.6

So OL = 0.6 × $405 million

= $243 million

OA = NOA + OL

= 405 + 243

= $648 million

Financial assets = total assets – operating assets

= 715 – 648

= $67 million

Financial liabilities = NFO + financial assets

= 100 + 67

= $167 million

Reformulated Balance Sheet

Operating assets	648	Financial liabilities	167
Operating liabilities	243	Financial assets	67
			100
		Common equity	305
	405		405

E11.4 Measures of Profitability and Leverage: Intel Corporation

(a) Return on assets (ROA) =

$$\frac{\text{Net income} + \text{Interest Expense (after tax)} + \text{Minority Interest}}{\text{Average Total Assets}}$$

$$= \frac{6{,}068 + (34 + 0.62)}{30{,}176}$$

= 20.2%

$$\text{Return on net operating assets} = \frac{\text{Comprehensive operating income (after tax)}}{\text{Average Net Operating Assets}}$$

$$= \frac{5{,}598}{11{,}027}$$

$$= 50.8\%$$

Comprehensive operating income is calculated in the solution to E9.1 in Chapter 9, as is NOA for 1998. NOA for 1997 is calculated as:

Common shareholders' equity		19,295
less Net financial assets		
Short-term debt	(212)	
Current maturities of long-term debt	(110)	
Long-term debt	(448)	
Put warrant obligation	(2,041)	
Cash equivalents	4,000	
Short-term investments	5,630	
Trading assets	195	
Long-tem investments	1,839	8,853
		10,442

Average NOA is the average of this 1997 number and the 1998 NOA of $11,611 million given in the solution to E9.1 in Chapter 9.

The RNOA is considerably higher then the ROA: the ROA is weighted down by the low return on financial assets that obscures the profitability of operations. And it ignores the leverage from operating liabilities.

(b) Debt-to-Equity $= \frac{\text{Total Liabilities}}{\text{Common Equity}}$

$$= \frac{9{,}585}{19{,}295}$$

$$= 0.50$$

[Some calculations of debt-to-equity include preferred stock in equity rather than debt.]

Financial leverage (FLEV) $= \frac{\text{NFO}}{\text{CSE}}$

$$= \frac{(8{,}853)}{19{,}295}$$

= -0.46

[Net financial assets are calculated above]

Intel has negative leverage because it has financial assets in excess of financial obligations. The traditional debt/equity ratio ignores the financial assets that effectively decrease debt. In addition, it confuses debt issued in financing activities with that incurred in operations. Intel's debt-to-equity ratio makes it look risky, but it is not: it has plenty of financial assets to meet claims on it.

The standard debt-to-equity ratio might be referred to in credit analysis, that is, in assessing the ability of the firm to meet its debts. But even then, one would want to factor in the financial assets that can pay off debt.

The analyst relies on the FLEV measure in profitability analysis. This measure gives the profitability leverage in ROCE over RNOA.

E11.5 Profit Margins, Asset Turnovers, and Return on Net Operating Assets: A What-If Question

The effect would be (almost) zero.

Existing RNOA = PM × ATO

= 3.8% × 2.9

= 11.02%

RNOA from new product line is

RNOA = 4.8% × 2.3

= 11.04%

E11.6 Analyzing Borrowing Costs: Reebok

$$\text{NBC} = \left[\frac{\text{FO}}{\text{NFO}} \times \frac{\text{After - Tax Interest on Financial Obligations}}{\text{FO}}\right] - \left[\frac{\text{FA}}{\text{NFO}} \times \frac{\text{After - Tax Interest on Financial Assets}}{\text{FA}}\right]$$

where FO = Financial obligations

FA = Financial assets

So,

$$\text{NBC} = \left[\frac{526}{405}\times\frac{42\times(1-0.354)}{526}\right]-\left[\frac{121}{405}\times\frac{11\times(1-0.354)}{121}\right]$$

$$= \left[\frac{526}{405}\times 5.16\%\right]-\left[\frac{121}{405}\times 5.87\%\right]$$

$$= 4.94\%$$

The components of the borrowing cost are

Borrowing cost on financial liabilities	5.16%
Return on financial assets	5.87%

The two components are weighted by the relative amounts of financial assets and financial obligations.

The calculation is based on weighting ending balances by 1/3 and beginning balances by 2/3. This weighting reflects the large debt issue for the stock repurchase in August of 1996. But the weighting may not be appropriate for financial assets (cash equivalents) or for other debt on the balance sheet.

Always check NBC calculations against the cost of debt in the debt footnote.

E11.7 A What-If Question: Grocery Retailers

Net operating assets for $120 million in sales and an ATO of 6.0 are $20 million.

An increase in sales of $15 million and an increase in inventory of $2 million would increase the ATO to $\frac{120+25}{20+2} = 6.59$.

With a profit margin of 1.5%, the RNOA would be:

RNOA = 1.5% × 6.59

= 9.89%

The current RNOA is:

RNOA = 1.6% × 6.0

= 9.6%

So the membership program would increase RNOA slightly.

E11.8 Financial Statement Analysis: Ben & Jerry's

First reformulate the financial statements (as in Exercise 10.6 in Chapter 10):

Balance Sheets

	1996	1995
Operating assets (OA):		
Trade receivables	8.7	11.7
Inventories	15.4	12.6
Other current operating assets	7.1	7.5
Plant, net	65.1	59.6
Equity investments	1.0	1.0
Other long-term operating assets	2.5	2.4
	99.8	94.8
Operating Liabilities (OL):		
Trade payables and accrued expenses	17.4	16.5
Deferred tax liability	4.8	3.5
	22.2	20.0
Net operating assets (NOA)	77.6	74.8
Net financial assets (NFA):		
Short-term investments	36.6	35.4
Other receivables	0.3	0.9
Current debt	(0.6)	(0.5)
Long-term debt	(31.1)	(32.0)
	5.2	3.8
Common shareholders' equity (CSE)	82.8	78.6

Averages for 1996:

NOA	76.2	OA	97.3
NFA	4.5	OL	21.1
CSE	80.7		76.2

Income Statements

		1996		1995
Net sales		167.1		155.3
Cost of sales		115.2		109.1
Gross profit		51.9		46.2
SG&A expense		(45.5)		(36.4)
Other income (expense)		0.2		(0.6)
OI		6.6		9.2
Tax reported	2.4		3.5	
Tax on financing income	0.1	2.5	(0.1)	3.4
OI after tax		4.1		5.8
Interest income	1.7		1.7	
Interest expense	(2.0)		(1.5)	
Net interest before tax	(0.3)		.2	

Tax (35%)	(0.1)	0.1
Net financial expense	.2	.1
Net comprehensive income	3.9	5.9

[Note: There is no dirty-surplus income as cumulative currency adjustments did not change.]

NOA	76.2	OA	97.3
NFA	4.5	OL	21.1
CSE	80.7		76.2

(a) $\text{FLEV} = \frac{\text{NFO}}{\text{CSE}} = \frac{-5.2}{82.8} = -0.063$

$$\text{OLLEV} = \frac{\text{OL}}{\text{NOA}} = \frac{22.2}{77.6} = 0.286$$

(b) $\text{RNOA} = \frac{\text{OI}}{\text{Ave. NOA}}$

$= \frac{4.1}{76.2}$

$= 5.38\%$

(c) RNOA = PM x ATO

$\text{PM} = \frac{4.1}{167.1} = 2.45\%$

$\text{ATO} = \frac{167.1}{76.2} = 2.19$ (use average NOA)

A Sales PM (before tax) can also be calculated by excluding Other Income:

$\text{Sales PM} = \frac{6.4}{167.1} = 3.83\%$

Decompose PM:

Gross margin ratio	31.06%
SG and A expense ratio	(27.23)
Other income ratio	0.12
Tax ratio	(1.50)
	2.45%

Decompose ATO

			Turnover	Inverse
Accounts receivable turnover	=	$\frac{167.1}{10.2}$	= 16.38	0.0611
Inventory turnover	=	$\frac{167.1}{14.0}$	= 11.94	0.0838
Other current asset turnover	=	$\frac{167.1}{7.3}$	= 22.89	0.0437
PPE turnover	=	$\frac{167.1}{62.4}$	= 2.68	0.3731
Other asset turnover	=	$\frac{167.1}{3.5}$	= 47.74	0.0209
Operating liability turnover	=	$\frac{167.1}{21.1}$	= (7.92)	-0.1263
Total ATO			2.19	0.4563

[Average NOA items used in denominators.]

Analyze operating liability leverage:

RNOA = ROOA + (OLLEV × OLSPREAD)

Implicit interest on operating liabilities = OL × 4%

= 21.1 × 4.0%

= 0.844

(A 4% after-tax rate is assumed.)

Return on operating assets (ROOA) = $\frac{4.1 + 0.844}{97.3}$

= 5.08%

Operating liability leverage = $\frac{OL}{NOA}$

$$= \frac{21.1}{76.2} \quad \text{(using averages for year)}$$

$$= 0.277$$

Operating liability leverage

Spread (OLSPREAD) = ROOA – 4.0%

= 1.08%

So,

RNOA = 5.08% + (0.277 × 1.08%)

= 5.38%

Minicases

M11.1. Analysis with Equity Accounting and the Use of Proportional Consolidation: AirTouch Communications

Introduction

This case provides an opportunity to discuss equity accounting, consolidation accounting and segment accounting, and to appreciate the frustrations that can arise in analyzing firms that use equity accounting for affiliate operations.

Equity accounting gives the net income share of affiliates but no detail on the components of income. Thus this income is difficult, if not impossible, to analyze unless one can get hold of the affiliates' financial statements.

Consolidation accounting gives revenue and expense details of affiliates' income, but the aggregation can be frustrating if it involves different lines of business. Difficulties in one business and success in another may be obscured. Segmented disclosures help to some extent but, as we see in this case, those disclosures are limited. Look at the consolidated statements of News Corp which involve over 100 companies in many countries. They are difficult to penetrate, to say the least.

Before beginning the case, review the accounting for investments in subsidiaries. See Accounting Clinics III and V. Also review the requirements for segmented disclosures (in particular FASB Statement No.131).

A: Using the GAAP Presentation

Reformulation using the information in GAAP statements:

Reformulated Income Statement

(in millions of dollars)

Operating revenues		$1,484
Cost of revenues	323	
Selling and customer expenses	464	
General, administrative and other	162	
Depreciation and amortization	285	1,234
Operating income from sales before tax		250
Other income		
Miscellaneous income	21	
Merger costs	(116)	(95)
		155
Tax as reported	98	
Tax benefit of net debt	12	110
		45
Minority interests in consolidated affiliates		(46)
Operating income before equity income		(1)
Equity in income of unconsolidated affiliates		202
Operating income after tax		201
Net financial expenses		
Interest expense	36	
Interest income	(4)	
	32	
Tax benefit (38%)	12	
Net interest after tax	20	
Preferred dividends	34	54
Net income applicable to common		147

This statement has allocated consolidated taxes to consolidated income but has left equity income as a net number. So only the income of ventures where there is more than a 50% interest can be analyzed:

$$\text{Profit margin before tax and other income} = \frac{250}{1{,}484} = 16.85\%$$

$$\text{Profit margin after tax} = \frac{45}{1{,}484} = 3.03\%$$

Individual expense ratios can also be calculated.

But does this give a picture of the profitability of operations. What if the profitability of unconsolidated affiliates were different from that of the consolidated operations? And note that a large portion of the profits of the consolidated operations accrue to the minority interests, not to AirTouch.

B: Using the Proportionate Presentation

The footnote on unconsolidated affiliates gives some information on the German affiliate, Mannesmann. It has a profit margin before tax of 4.1%, but this is based on operating income of $522 million that is considerably greater than the $250 million for the consolidated operations.

The proportionate presentation captures the profitability of AirTouch's interests:

	US Cellular and PSC Operations		International Operations		US Paging Operations		Total Company	
	$	%	$	%	$	%	$	%
Revenues	1,116	100.0	1,079	100.0	102	100.0	2,297	100.0
Op. exp. before DA	673	60.3	629	58.3	72	70.6	1,400	60.9
	443	39.7	450	41.7	30	29.4	897	39.1
Depr. and amort.	261	23.4	112	10.4	20	19.6	395	17.2
OI before tax	182	16.3	338	31.3	10	9.8	502	21.9
Tax reported							188	8.2
Tax benefit (below)							51	2.2
OI after tax							263	11.4
Interest and other							133	
Tax effect							51	
							82	
Preferred dividends							34	
							116	
Net income to common							147	

Profit margins and their component parts are identical in this analysis, not only for the total company but also for segments.

M11.2 Analysis of the Return on Common Equity and Some "What-If" Questions: VF Corporation

This case illustrates the profitability analysis in this chapter. To become familiar with the firm, review the short description of the firm in the case and on the firms' web page at www.vfc.com . Also look at the background information of the firm and its strategy in the annual 10-K report. The more the student is familiar with a firm's operations, the more the financial statement analysis comes to life.

The reformulated statements in the case are the basis for the analysis.

Question A: Analysis

Review the analysis tree in Figure 11.1 before proceeding.

1. First-level analysis

Average balance sheet amounts for calculations (in millions of dollars):

Net operating assets (NOA)	2,596
Net financial obligations (NFO)	629
Common equity (CSE)	1,967
Operating assets (OA)	3,523
Operating liabilities (OL)	927
NOA	2,596
Financial assets (FA)	80
Financial obligations (FO)	709
NFO	629

Financial leverage affect:

$$\text{ROCE} = \text{RNOA} + [\text{FLEV} \times (\text{RNOA} - \text{NBC})]$$

$$\text{ROCE} = \frac{393}{1{,}967} = 19.98\%$$

$$\text{RNOA} = \frac{434}{2{,}596} = 16.72\%$$

$$\text{FLEV} = \frac{629}{1{,}967} = 0.320$$

$$\text{NBC} = \frac{41}{629} = 6.52\%$$

Proofing:

$$19.98\% = 16.72\% + [0.320 \ (16.72\% - 6.52\%)]$$

Operating liability leverage effect:

$$\text{RNOA} = \text{ROOA} + [\text{OLLEV} \times \text{OLSPREAD}]$$

Implicit interest on operating liabilities = $927 \times 4.0\% = 37$
(using a 4% rate)

$$\text{ROOA} = \frac{434 + 37}{3{,}523} = 13.37\%$$

$$\text{OLLEV} = \frac{927}{2{,}596} = 0.357$$

$$\text{OLSPREAD} = 13.37\% - 4.0\% = 9.37\%$$

Proofing:

$$16.72\% = 13.37\% + (0.357 \times 9.37\%)$$

In words:

VF Corporation's 19.98% ROCE in 1998 was produced by a return on net operating assets of 16.72% that was levered up by net financial leverage of 32% of common equity. This leverage geared up a favorable spread of operating profitability over the net after-tax borrowing cost of 6.52%.

VF's operating profitability was also levered up by favorable operating liability leverage of 36% of net operating assets: VF utilized operating credit to its advantage.

2. Second-level analysis

RNOA	=	PM	×	ATO
Profit Margin (PM)	=	$\frac{434}{5{,}479}$	=	7.92%
Asset turnover (ATO)	=	$\frac{5{,}479}{2{,}596}$	=	2.11

Proofing:

16.72%	=	7.92%	×	2.11

3. Third-level analysis

Analysis of profit margin of 7.92%:

Gross margin	=	$\frac{1{,}892}{5{,}479}$	=	34.53%
Miscellaneous income to sales	=	$\frac{3}{5{,}479}$	=	0.05
Advertising expense ratio	=	$\frac{288}{5{,}479}$	=	(5.26)
Administrative expense ratio	=	$\frac{911}{5{,}479}$	=	(16.63)

Other expense ratio	=	$\frac{9}{5{,}479}$	=	(0.16)
Other income ratio	=	$\frac{11}{5{,}479}$	=	0.20
PM before tax	=	$\frac{699}{5{,}479}$	=	12.76
Tax ratio	=	$\frac{265}{5{,}479}$	=	4.84
PM	=	$\frac{434}{5{,}479}$	=	7.92

In words:

A dollar of sales yielded 34.53 cents of profit after cost of the goods sold. Advertising to maintain the sales absorbed 5.26 cents for every dollar of sales and administrative expenses absorbed 16.63 cents. After taxes of 4.84 cents per dollar of sales and some minor items, the firm produced 7.92 cents of profit for a dollar of sales.

Analysis of asset turnover of 2.11:

			Turnover	Reciprocal of Turnover
Accounts receivable turnover	=	$\frac{5{,}479}{649}$	8.47	0.118
Inventory turnover	=	$\frac{5{,}479}{865}$	6.33	0.158
PPE turnover	=	$\frac{5{,}479}{741}$	7.39	0.135
Intangible turnover	=	$\frac{5{,}479}{883}$	6.20	0.161
Deferred asset turnover	=	$\frac{5{,}479}{191}$	28.69	0.035
Other asset turnover	=	$\frac{5{,}479}{197}$	27.81	0.036

Operating liability turnover	=	$\frac{5,479}{927}$	(5.91)	(0.169)
ATO			2.11	0.474

In words:

VF utilized investment in net operating assets to generate $2.11 dollar of sales for a dollar of investment. Or, stated differently, each dollar of sales used 47.4 cents of net operating assets, including an investment in accounts receivable of 11.8 cents, inventory of 15.8 cents, PPE of 13.5 cents, and goodwill on purchased firms of 16.1 cents. The asset turnover was levered up by operating liabilities of 16.9 cents per dollar of sales.

Analysis of net borrowing cost of 6.52%:

Net interest cost before tax was 8.9% of net financial obligations and 5.5% after tax. Preferred stock added to the borrowing cost, in the form of preferred dividends and a loss on conversion of preferred stock to common.

A qualifying note: Calculations are based on averages of beginning and ending balance sheet amounts. If balances did not change evenly over the year, there will be approximations in the calculations. Note particularly the large percentage drop in cash equivalents and the increase in short-term borrowings.

Question B: What-if Questions

(1) At the point where RNOA = NBC, that is, if RNOA fell below 6.52%.

But note that 6.52% includes the loss on the redemption of preferred stock which may be temporary. So the leverage indifference point will be at the "core" borrowing rate of $\frac{38,357}{629,393}$ = 6.09% that includes preferred dividends but excludes the loss.

(2) This financing transaction will have no effect on RNOA.

(3) There would be no effect on ROCE because net financial obligations and leverage will not be affected: the cash equivalents are netted out against debt in the NFO, so actually using the cash to pay off debt will not affect the NFO. (There would also be a small change in the net borrowing cost if the interest rate on the cash equivalents is different from the borrowing rate for debt.)

(4) ROCE would increase because of an increase in leverage:

	1998	1997	Average
NFO, as is	774	485	
Liquidation of financial assets	48	48	
NFO, as is	822	533	678
CSE, as is	2,066	1,867	
Share repurchase	48	48	
	2,018	1,819	1,919
Financial leverage (FLEV), as is	0.320		
Financial leverage (FLEV), as is	0.353		

As if ROCE = RNOA + [FLEV + SPREAD]
= 16.72% + 0.353 × 10.2%
= 20.32%

(5) If prices of inputs were to drop by the amount of the imputed interest on the credit, the operating income (at an implicit after-tax borrowing rate of 4%) would be:

Average payables x 4%	=	$321 × 0.04	=	$ 13
Operating income, as is				434
Operating income, as is				447
NOA, as is				2,596
Loss of payables				321
NOA, as is				2,917
RNOA, as is				16.72%
RNOA, as if = $\frac{447}{2,917}$				15.32%

$$\text{As if RNOA} = \text{ROOA} + (\text{As if OLLEV} \times \text{As if OLSPREAD})$$
$$= 13.37\% + \left(\frac{606}{2{,}917} \times 9.37\%\right)$$
$$= 15.32\%$$

(6) ROCE would, of course, be reduced by the change in RNOA from 16.72% to 15.32%. But two other things will change:

1. The operating SPREAD will change because the RNOA changes.
2. The firm will have to finance the purchase of inventory with cash.

Spread effect:

SPREAD, as is = 16.72% - 6.52% = 10.2%

SPREAD, as is = 15.32% - 6.52% = 8.8%

ROCE, as if = 15.32% + (0.320 × 8.8%)

= 18.14%

Financial leverage effect:

Suppose the firm were to issue shares to raise the cash (with no change in net debt).

CSE, as is	=	1,967
Share issue	=	321
CSE, as is	=	2,288

Financial leverage, as if = $\frac{629}{2{,}288} = 0.275$

ROCE, as if = 15.32% + (0.275 × 8.8%)

= 17.74%

The firm might borrow to get the cash in which case FLEV would be 0.483. If the borrowing were at the same net borrowing cost as existing debt, then ROCE would be:

ROCE, as if = 15.32% + (0.483 × 8.8%)

= 19.57%

Notice that the increase in leverage increases ROCE even though there is a drop in the profitability of operations.

(7) An increase in gross profit margin of 1% (before tax) would translate into an after-tax increase in the profit margin (PM) of 0.62% to 8.54% (for a 38% tax rate). At the (as-is) asset turnover of 2.11, the RNOA would be:

$$\text{A- is RNOA} = 8.54\% \times 2.11$$

$$= 18.02\%$$

(8) $$\text{As-if ROCE} = 18.02\% \times [0.320 \times (18.02\% - 6.52\%)]$$

$$= 21.70\%$$

The valuation part of the question servers to introduce students to issues in Part III of the book. Proceeding naively, the residual earnings model is applied, with no growth, as follows:

$$V^E = CSE + \frac{(ROCE - \text{cost of capital}) \times CSE}{\text{cost of capital}}$$

So, with an assumed cost of capital of 11% (say):

$$V^E, \text{ as is} = 1{,}967 + \frac{(0.1998 - 0.11) \times 1{,}967}{0.11}$$

$$= \$3{,}573 \text{ million}$$

$$V^E, \text{ as if} = 1{,}967 + \frac{(0.2170 - 0.11) \times 1{,}967}{0.11}$$

$$= \$3{,}880 \text{ million}$$

The complete answer can only be given with a forecast of growth in CSE that will earn at the higher ROCE. The perceptive student will see that such growth will imply a change in leverage and thus a drop in the cost of capital. Part III finesses this problem.

(9) Maintaining advertising expenses at the same level at 1997 would increase the 1999 expense by $21.8 million or 0.4% of sales. The effect on the profit margin, after tax, would have been to reduce it from 7.92% to 7.67%. At an ATO of 2.11, the RNOA would have been 16.19% rather than 16.72%.

The quality of the 1998 RNOA needs to be investigated: is VF generating higher RNOA at the expense of lost futures sales and profits from reduced advertising?

Question C: Further Questions

Any question can be addressed that affects the following:

- Financial leverage
  - debt issues
  - debt-for-equity swaps
  - stock issues
  - change of dividend payout
- New investment in net operating assets
- Change in the structure of expenses
- Growth or fall in sales
- New product line
- Efficiency of advertising: sales generated per dollar of advertising
- "Cost cutting"
- Change in tax rates
- Change in borrowing costs