

CHAPTER THIRTEEN

The Value of Operations and the Evaluation of Enterprise Price-to-Book Ratios and Price-Earnings Ratios

Concept Questions

C13.1 Forecast earnings as the book value of the asset earning at the required rate of return:

$$\text{Forecasted Earnings} = \text{Required Rate of Return} \times \text{Book Value of Asset}$$

This will be a good forecast if the book value of the asset is at (efficient) market value. So, applying the required rate on a bond to the book value of a bond will give the expected interest to be earned on the bond if the bond is recorded at fair value.

C13.2 Yes: for assets marked to market, income is just the change in market value plus any dividend. Changes in market value do not say anything about the value of the assets. And dividends (in principle) are not related to value. Details of the income are not needed, however, as the balance sheet gives the value (provided the market value is an efficient price).

C13.3 This is correct. The assets are expected to earn at their required return. Therefore expected residual income is zero.

C13.4 The shares held may not be priced efficiently. If the fund is an actively managed fund, the fund managers are investing in shares that they think are under-priced. So the fund might trade at a premium.

C13.5 Residual operating income growth is driven by

1. Increases in the return on net operating assets
2. Growth in net operating assets
3. Decline in the cost of capital for operations

C13.6 Yes. ROCE and residual earnings may decrease because of a drop in financial leverage, even though RNOA and residual operating income increase.

C13.7 A financing risk premium is the additional risk that equity holders have of losing value because the firm cannot meet obligations on its net debt. The premium will be negative if the firm has net financial assets rather than net financial obligations.

C13.8 This statement is incorrect. The required return for equity is a weighted average of the required return for operations and that for net financial assets. As the required return on net financial assets is typically less than that for operations, the required return for equity is greater than that for operations. (The relationship is reversed if the firm has net financial obligations.)

C13.9 Earnings per share can be increased by increasing leverage. See the example in Box 13.7 in the chapter and the stock repurchase example for Reebok. Although leverage increases eps, leverage does not increase value (apart from tax effects, if they exist). So management can increase their bonuses without

creating value for shareholders by increasing leverage. They increase risk, but not value.

Residual operating income is a more desirable metric. It focuses on operations (where value is created) and is not affected by financing.

C13.10 Shareholders' wealth declines. A share repurchase increases ROCE so, in this case, increases management's bonus pay. But a change in ROCE does not create value for shareholders – unless the repurchase is at a price that is less than fair value.

C13.11 ROCE and residual earnings are indeed affected by a change financial leverage. But, following the argument through, the required return for equity also changes with leverage such that the present value of forecasted residual earnings (and thus the equity value) is unchanged.

C13.12 No. This statement is only correct for a firm with positive financial leverage (FLEV greater than zero which implies financial obligations are greater than financial assets) and unlevered price-to-book ratios greater than 1.0.

C13.13 The effect of these repurchases and borrowings was to increase earnings per share growth and ROCE for the time that the leverage remained favorable (that is, operations were profitable). In the downturn, leverage turned unfavorable, damaging the equity of highly leveraged firms, for operating income was not sufficient to cover debt service.

C13.14 Correct. The P/E is determined by the required rate of growth and earnings growth in excess of the required rate. Lower required rates of return mean higher P/E ratios, and higher growth means higher P/E ratio. The required rate of growth is related to risk. So the P/E is higher if risk is low, but even higher if a lot of growth is forecast.

C13.15 An increase in financial leverage increases equity risk and the required return for equity. The levered P/E declines provided the operating income yield is higher than the net borrowing cost, NBC (or, equivalently, the enterprise P/E is less than $1/\text{NBC}$). See formulas 13.11 and 13.12.

C13.16 Correct. See the answer to C13.14. Low risk and high growth translate into a high P/E.

Exercises

E13.1 Using Market Values in the Balance Sheet: Penzoil

The investment in Chevron is an operating asset and the income from the investment is operating income. But the income reported from the investment is in the form of dividends and unrealized gains and losses, neither of which is

very informative about the value of the Chevron shares. The fair value is, however.

So, to value PennzEnergy, include the Chevron shares in net operating assets at market value and apply the residual operating income model to the rest of the operations. Calculate residual operating income by excluding Chevron dividends and unrealized gains from operating income and exclude the Chevron investments from the NOA to be charged at the cost of capital:

Value of PennzEnergy's operations

= Net operating assets + Present value of residual earnings from operations other than the Chevron investment.

The ReOI adjusted for the Chevron investment is:

Operating income before Chevron dividends and unrealized gains

- [cost of capital for operations x (NOA – Fair Value of Chevron investments)]

This applies the principle that forecasting is not required for assets at fair value on the balance sheet.

Note: This evaluation does assume that the fair (market) value of Chevron's shares is an "efficient" one.

E13.2 The Quality of Carrying Values for Equity Investments: SunTrust Bank

Sun Trust Banks acquired the Coke shares many years earlier. The historical cost of \$110 million is a poor indicator of their value. The current market value of \$1,077 million is a better quality number. But beware: was the market value an efficient price, or was Coke undervalued or overvalued in the market? Would we accept the market value of Coke's shares during the bubble of 1997-2000 as fair value? Coke was a hot stock then whose market price subsequently declined.

E13.3 Levered and Unlevered Price-to-Book Ratios: General Mills

- (a) Reformulate the balance sheet to identify net operating assets:

Net financial obligations (NFO):

Current portion of long-term debt	129.6
Notes payable	751.1
Long-term debt	1,687.3
Cash and cash equivalents	<u>(46.0)</u>
	2,522.0
Common shareholders' equity (CSE)	<u>216.3</u>
Net operating assets (NOA)	<u>2,738.3</u>
Value of equity (304.2 million shares x 42)	\$12,776.4 million
Value of NFO (at book value)	<u>2,522.0</u>
Value of Firm	<u>\$15,298.4 million</u>
Levered P/B (12,776.4/216.3)	59.07
Unlevered P/B (15,298.4/2738.3)	5.59

The unlevered ratio makes most sense: the levered ratio reflects financing items but these are measured close to market value on the balance sheet. The difference between market and book value comes from the net operating assets.

- (b)

$$\text{Levered P/B} = \text{Unlevered P/B} + \text{FLEV} \times [\text{Unlevered P/B} - 1.0]$$

$$59.11 = 5.59 + 11.66 \times 4.59 \text{ (allow for rounding error)}$$

Financial leverage explains the difference and financial leverage is very high:

$$\text{FLEV} = \text{NFO/CSE} = 2,522.0/216.3 = 11.66$$



E13.4 Levered and Unlevered P/E Ratios

First value the firm from forecasted residual operating income or abnormal operating income growth:

Residual operating income	18	18	18
Abnormal operating income growth		0	0
PV of ReOI(18/0.09)	200		
Net operating assets	<u>1300</u>		
Value of operations	1500		
Net financial obligations	<u>300</u>		
Value of equity	1200		
Forecasted free cash flow: OI-ΔNOA	135	135	135
Forecasted dividend: d=Earnings - ΔCSE	120	120	120
(a) Forecasted value of operations	1,500	1,500	1,500
Forecasted value of equity	1,200	1,200	1,200
(b) Levered P/E ratio	11.00	11.00	11.00
Unlevered P/E ratio	12.11	12.11	12.11

The forecasted residual operating income is expected to be a perpetuity of \$18 million, and net operating assets are expected to be \$1,300 always. So the value of the operations is expected to be $1,300 + \left(\frac{18}{0.09} \right) = 1,500$ in all years. The "cum-dividend" value of the operations for 2001 is $1,500 + \text{free cash flow} = 1,500 + 135 = 1,635$. So the "cum-dividend" value is growing at the required return of 9% (and so on for subsequent years).

The value of the operations can also be calculated using the abnormal earnings growth method. As residual earnings is not forecasted to grow, abnormal operating income growth (AOIG) is forecasted to be zero. Accordingly, the value of the operations is calculated by capitalizing forward operating income:

$$V^{NOA} = 135/0.09 = 1,500$$

and so for all years.

The value of the equity is (with similar reasoning) expected to remain at \$1,200. The cum-dividend equity value in 2001 is expected to be $1,200 + 120 = \$1,320$

The levered and unlevered trailing P/E ratios are calculated using these cum-dividend (dividend-adjusted) values:

$$\text{Unlevered Trailing P/E} = \frac{\text{Value}_0 + \text{Free Cash Flow}_0}{\text{Operating Income}_0}$$

$$= \frac{1,500 + 135}{135}$$

$$= 12.11$$

This P/E is a normal for a cost of capital for operations of 9%: $\frac{1.09}{0.09} = 12.11$.

The unlevered forward P/E is:

$$\text{Unlevered Forward P/E} = \frac{\text{Value}_0}{OI_1}$$

$$= \frac{1,500}{135}$$

$$= 11.11$$

This is normal for a cost of capital of 9%: $\frac{1}{0.09} = 11.11$. Normal unlevered P/E's are

appropriate because residual operating income is forecasted to be constant and abnormal operating income growth is zero.

Now to the levered P/E:

$$\text{Trailing Levered P/E} = \frac{\text{Value} + \text{Dividends}}{\text{Earnings}}$$

$$= \frac{1,200 + 120}{120}$$

$$= 11.0$$

This is a normal P/E for a cost of capital of 10%.

$$\text{Forward Levered P/E} = \text{Value} / \text{Forward earnings}$$

$$= 1,200 / 120$$

$$= 10$$

This is a normal P/E for a cost of capital of 10%.

- (c) As earnings are expected to be constant (at \$1,000 million), residual earnings (on equity) must also be constant. So the levered P/E is a normal P/E. For a normal P/E of 11.0, the equity cost of capital is 10%.

You can prove this with the calculation:

$$\text{Required equity return} = 9\% + \left[\frac{300}{1,200} \times (9\% - 5\%) \right] = 10\%$$

E13.5 Calculating Residual Operating Income: Dell Computer

$$\text{NOA} = 3,080 - (3,501) = -421$$

$$\text{ReOI} = \text{OI} - (0.16 \times \text{NOA})$$

$$= 1435 + 67.36$$

$$= 1502.36$$

Dell generated value in operations from

- (1) Operating income of \$1,435 million
- (2) A negative investment in NOA: shareholders earned 16% on operating debt in excess of operating assets. (Operating creditors financed operating assets, interest free, and more). Dell used other people's money.

Further analysis of the drivers of residual operating income would involve analysis of profit margins and asset turnovers. See minicase M12.1 at the end of Chapter 12.

E13.6 Forecasting Residual Operating Income and Abnormal Operating Income Growth

Residual operating income (ReOI) and abnormal operating income growth (AOIG) forecasts are developed as follows:

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Cash from operations		30	70	40

Cash investment		<u>45</u>	<u>55</u>	<u>90</u>
C-I		<u>(15)</u>	<u>15</u>	<u>(50)</u>
NOA = CSE + NFO	250	290	320	430
Δ NOA		40	30	110
OI = C - I + Δ NOA		25	45	60
ReOI		<u>0</u>	<u>16</u>	<u>28</u>
AOIG			16	12

Notes on the calculations :

$$\text{ReOI}_t = \text{OI}_t - (0.10 \times \text{NOA}_{t-1})$$

$$\text{AOIG}_t = \text{ReOI}_t - \text{ReOI}_{t-1}$$

AOIG can also be calculated by forecasting OI growth, with reinvestment of free cash flows, and subtracting normal growth. So, for 2005,

$$\begin{aligned} \text{AOIG} &= 45 + (0.10 \times -15) - (1.10 \times 25) \\ &= 16 \end{aligned}$$

E13.7 Valuation of Operations: Nike, Inc.

(a)

Analysts' eps forecast	\$4.50
Shares outstanding	<u>144.0 million</u>
Analysts' earnings forecast	\$648.0 million
Forecast of net financial expenses	
228×0.035	8.0
Forecast operating income	<u>\$656.0 million</u>
Forecasted RNOA = $\frac{656}{2659}$ (using beginning-of-year NOA)	24.67%

(b) Forecasted ReOI = $[24.67\% - 11.0\%] \times 2,659 = 363.51$ million

$$\begin{aligned} \text{Value} &= 2,431 + \frac{363.51}{1.11 - 1.07} \\ &= \$11,519 \text{ million, or } \$80.00 \text{ per share} \end{aligned}$$

(c) If ReOI are to grow at 7%, then abnormal operating income growth will also grow at

at 7%, and the formula for calculating the value of the equity will be

$$\text{Value of equity} = \frac{1}{\rho_F - 1} \left[OI_1 + \frac{AOIG_2}{\rho_F - g} \right] - \text{NFO}$$

where g is the forecasted growth rate of 7%.

First calculate AOIG two years ahead (1998). There are two methods for doing this.

Method 1: Difference between cum-FCF OI for 1998 minus normal OI for 1998

$$\text{Forecast of OI for 1998} = \text{NOA}_{1997} \times \text{RNOA}_{1998}$$

$$\text{NOA}_{1997} = 2,659 \times 1.07$$

$$= 2,845.13$$

$$\text{OI}_{1998} = 2,845.13 \times 0.2467$$

$$= 701.89$$

$$\text{FCF}_{1997} = \text{OI}_{1997} - \Delta \text{NOA}$$

$$= 656.0 - 186.13$$

$$= 469.87$$

$$\text{AOIG}_{1998} = \text{OI}_{1998} + \text{FCF}_{1997} \text{ reinvested} - (1.11 \times \text{OI}_{1997})$$

$$= 701.89 + (0.11 \times 469.87) - (1.11 \times 656.0)$$

$$= 25.42$$

Method 2: AOIG is growth in residual operating income from the previous year

$$\text{AOIG}_{1998} = \text{ReOI}_{1997} \times 0.07$$

$$= 363.51 \times 0.07$$

$$= 25.45 \text{ (allow for rounding error)}$$

Accordingly, the valuation is:

$$\text{Value of equity} = \frac{1}{0.11} \left[656 + \frac{25.45}{1.11 - 1.07} \right] - 228$$

$$= 11,519, \text{ or } \$80.00 \text{ per share}$$

(d) Value of operations = Value of equity + NFO

$$= 11,519 + 228$$

$$= \$11,747 \text{ million}$$

(e) ReOI is driven by RNOA and growth in net operating assets. So, if RNOA is forecasted to be constant, net operating assets must be forecasted to grow at 7% per year.

E13.8 Analyzing Value Generated from Operations: Ben & Jerry's

(a) Refer to the solution to Exercise E.7 in Chapter 10. That solution establishes ingredients for the solution here:

Average net financial assets	4.5
Return on net financial assets ($^{0.2/4.5}$)	4.4%
Net financial assets, 1996 year end	5.2

The equity cost of capital according to the CAPM is:

$$\text{Equity cost of capital} = 5.0\% + (0.90 \times 6.0\%)$$

$$= 10.4\%$$

Additional ingredients to get cost of capital for operations are:

$$\text{Market value of the equity} = 7.2 \text{ million shares} \times \$15 = \$108.0 \text{ million}$$

$$\text{Value of operations} = 108.0 - 5.2 = \$102.8 \text{ million}$$

The cost of capital for operations is:

Cost of capital for operations =

$$\begin{aligned} & \left[\frac{\text{Value of equity}}{\text{Value of operations}} \times 10.4\% \right] - \left[\frac{\text{Value of NFA}}{\text{Value of operations}} \times 4.4\% \right] \\ &= \left[\frac{\$108.0}{102.8} \times 10.4\% \right] - \left[\frac{5.2}{102.8} \times 4.4\% \right] \\ &= 10.703\%. \end{aligned}$$

Reservations about the calculations:

1. The beta is probably estimated with error. Typical standard errors in estimated betas are about 0.3.
2. The equity risk premium of 6% is a doubtful number. Some analysts set it as low as 3%, others as high as 9%. Frankly, we do not know how to measure the equity risk premium.
3. The CAPM might not be the correct risk model. Should other risk factors be included?
4. Market prices are used to get the cost of capital for operations from the equity cost of capital. What if the market price is inefficient? The formula requires intrinsic (efficient) values to do the weighting. If inefficient market prices are used, error is introduced.

(b)

$$\begin{aligned} \text{ReOI} &= \text{OI} - (10.91\% \times \text{Average NOA}) \\ &= 4.1 - (10.91\% \times 76.2) \\ &= -4.21 \end{aligned}$$

(The calculation could also be made with beginning-of-year NOA).

Ben & Jerry's earned an RNOA of 5.38% during the year. But the required return for operations that the market was demanding was 10.91% (if the calculations in (a) are to be believed). Ben & Jerry's is not adding value.

E13.9 Growth, the Cost of Capital, and the Normal P/E Ratio

- (a) The repurchase was at fair value (value received was equal to value surrendered). So there is no effect on value. More technically, the value of the equity is driven by the value of the operations and the value of the operations did not change. The total dollar value of the equity changed, but not the per-share value.
- (b) The \$10.00 million is operating income (from operations) with no debt service. The net financial expense increased to \$2.50 million due to the new debt, reducing earnings (to the equity) to \$7.5 million.
- (c) Although forecasted earnings decreased to \$7.5 million, shares outstanding dropped from 10 million to 5 million, increasing eps: stock repurchases increase eps (providing leverage is favorable).
- (d) The required return for the equity is given by the following calculation:

$$\begin{aligned} \text{Required Equity Return} = & \\ & \text{Required Return for Operations} \\ & + (\text{Market Leverage} \times \text{Required Return Spread}) \end{aligned}$$

where

$$\text{Market Leverage} = \frac{\text{Value of Net Debt}}{\text{Value of Equity}}$$

$$\text{Required Return Spread} = \text{Required Return for Operations} - \text{After-tax Cost of Debt}$$

So, after the stock repurchase,

$$\begin{aligned} \text{Required return for equity} &= 10\% + \left[\frac{\$50\text{million}}{\$50\text{million}} \times (10\% - 5\%) \right] \\ &= 15\% \end{aligned}$$

- (e) The expected ROCE for Year 1 is 15%, an increase over the 10% before the repurchase. As the required return was 15%, the expected residual earnings is zero – as must be the case for the equity is worth its book value.

- (f) The case with leverage:

The equity must be worth its book value (as expected residual operating income for years after Year 1 is zero), and expected Year 1 book value, is \$57.50 million, or \$11.50 per share.

The case with no leverage:

Again, the value of the equity must be worth its book value, \$110.0 million, or \$11.00 per share.

The leverage case gives a higher expected price per share (target price) at the end of Year 1, so it looks as if leverage has added value. But, the expected price must be higher in the leverage case to yield a higher expected return to compensate for the higher risk of not getting the expected price. Equity value is always expected to grow at the required equity return (before dividends). In the leverage case, Year 0 per-share value is \$10.00 and the required return is 15%, giving an expected Year 1 value of 11.50 (\$10.00 x 1.15). In the no leverage case, Year 0 per-share value is also \$10.00, but the required return is only 10%, giving an expected Year 1 value of \$11.00 (\$10.00 x 1.10). In both cases, the present value of the expected Year 1 price is \$10.00, discounting with the (leverage) risk adjusted discount rate.

Note that the value of the equity in the leverage case is expected to grow at 14.6% in Year 2 because that is the required return for equity at the beginning of Year 2: financial leverage has changed over Year 1, changing the required return. Note that the ROCE for Year 2 is 14.6% also, giving expected residual earnings of zero for Year 2. Do you see how accounting data and required returns fit together?

(g) For the leverage case:

The eps in Year 1 is expected to be \$1.50 and the price-per-share is expected to be \$11.50. So the P/E is 7.67. This P/E is appropriate for a normal P/E. The required equity return is 15%. (after the stock repurchase) and so the normal P/E is $\frac{1.15}{0.15} = 7.67$.

For the no-leverage case:

Eps in Year 1 are expected to be \$1.00 and the price \$11.00. So the P/E is expected to be 11.0. This is a normal P/E for a required return of 10%.

Why are the two P/Es different? Well, they are both normal P/Es, so earnings growth is expected at a rate equal to the required return. But the required equity return is different, and P/E ratios are based on both expected growth and the required return.

E13.10 Levered and Unlevered P/B and P/E

$$\text{Value of the equity} = \$233 \times 2.9$$

$$= \$675.7$$

$$\text{Value of the operations} = \$675.7 + 236$$

$$= \$911.7$$

$$(a) \quad \text{Levered P/E} = 675.7/56 = 12.07 \quad (\text{no dividends})$$

$$(b) \quad \text{Enterprise P/B} = 911.7/469 = 1.94$$

$$\text{Enterprise P/E} = (V^{\text{NOA}} + \text{FCF}) / \text{OI}$$

What was the free cash flow? Free cash flow is equal to

$$C - I = NFE - \Delta NFO + \text{dividends}$$

$$= 14 - 0 + 0 \quad (\text{no change in NFO and no dividends})$$

$$= 14$$

Thus,

$$\text{Enterprise P/E} = (911.7 + 14)/70$$

$$= 13.22$$

You might prove that the levered and unlevered multiples reconcile according to equations 13.10, 13.11, and 13.12 in the text. (The net borrowing cost (NBC) = $14/236 = 5.93\%$).

Minicases

M13.1 Valuing the Operations and the Investments of a Property and Casualty Insurer: Chubb Corporation

Introduction

Property and casualty insurers had a difficult time in the 1990s, typically reporting operating losses on underwriting. They covered those losses, often barely, with investment income on the assets in which the float from underwriting was invested. Chubb was no exception, as the combined loss and expense ratios in the case demonstrate.

This case shows how the separation of the various activities uncovers the difficulties the firm is facing and brings focus to the valuation. And it shows how the

accounting for financial assets and liabilities at market value can short cut the valuation process.

Before beginning this case, review exercises E9.6 and E9.8. Using reformulated financial statements, these exercises show how property-casualty insurers make money with negative investment in underwriting activities (the float) that is invested in investment assets. Warren Buffet and Berkshire Hathaway follow this model. They see themselves as being good at assessing and pricing risk, so good at generating value in the insurance business. But they also see themselves as good (fundamental) investors in equities. The insurance business adds value and at the same time provides the cash to invest in other businesses.

Reformulation

Begin, as usual, with a reformulation of the financial statements.



Chubb Corp.

Reformulated Income Statement, Nine months Ending September 30
(in \$ Millions)

	1999	1998
Underwriting and real estate operations:		
Premiums earned	4,209.4	3,966.9
Foreign currency translation losses ¹	(9.4)	(12.1)
Claims and expenses:		
Insurance claims	2,957.5	2,589.4
Amortization of deferred policy acquisition costs	1,136.1	1,096.3
Other costs	281.2	277.2
	(4,374.8)	(3,962.9)
Operating income before tax—underwriting	(174.8)	(8.1)
Real estate operations:		
Revenues	78.5	70.7
Costs of sales and expenses	81.1	73.4
Operating income before tax—real estate	(2.6)	(2.7)
Corporate expenses	(39.9)	(22.7)
Operating income before tax	(217.3)	(33.5)
Income tax reported	61.0	119.5
Tax on investment income and unusual items	(111.9)	(98.1)
	(50.9)	21.4
Core Operating income	(166.4)	(54.9)
Unusual item		(40.0)
Tax on unusual item		14.4
		(25.6)
Operating income, underwriting and real estate	(166.4)	(80.5)
Investment operations:		
Before-tax revenues:		
Investment income	654.8	613.8
Realized investment gains	82.8	126.7
	737.6	740.5
Expenses	11.2	10.2
Income before tax	726.4	730.3
Tax (at 15.4%) ²	111.9	112.5
Income after tax	614.5	617.8
Unrealized investment income after tax	(400.3)	(24.0)
	214.2	593.8
Comprehensive income	47.8	513.3

Notes: 1. As real estate operations are in the U.S., currency translation is identified with

underwriting in other countries. This could be broken out into an unusual item category.

2. Tax is on total investment income minus tax-exempt income: tax-exempt income is 53% of total investment income of 654.8 million. The tax rate is the effective rate on total investment income.



Chubb Corp.
Reformulated Balance Sheet, December 31, 1998
(in \$ millions)

Operating Assets: underwriting and real estate

Cash	8.3	
Accrued investment income	221.0	
Premiums receivable	1,199.3	
Reinsurance recoverable on unpaid claims	1,306.6	
Prepaid reinsurance premiums	134.6	
Funds held for asbestos- related settlement	607.4	
Deferred policy acquisition settlement	728.7	
Real estate assets	746.0	
Deferred income tax	320.8	
Other assets	718.0	
		<u>5,990.7</u>

Operating Liabilities: underwriting and real estate

Unpaid claims	10,356.5	
Unearned premiums	2,915.7	
Accrued expenses and other liabilities	1,171.9	<u>14,444.1</u>

Net Operating Assets: underwriting and real estate (8,453.4)

Assets: Investment Operations

Short-term investment	344.2	
Fixed maturity investment-held to maturity	2,002.2	
Fixed maturity investment-available for sale	11,316.7	
Equity investments	1,092.2	<u>14,755.3</u>

Financial liabilities

Long-term debt	<u>607.5</u>
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Net assets: investment operations 14,147.8

Common shareholders' equity

As reported	5,644.1	
Dividends payable	50.3	
	<u>5,694.4</u>	

Note that dividends payable has been reclassified as shareholders' equity.

Note also that net operating assets from underwriting are negative: insurers effectively get policyholders to provide funds that are then invested in investment assets.

Note also that, in this business, all of the net assets are operational assets: property-casualty insurers invest the float (negative NOA) from underwriting in a managed

investment portfolio. So, even though some of the investment assets look like “financial assets,” they are operational assets. These insurers run an underwriting operation (and real estate) and an investment management operation. Both operations contribute to value.

At this point, review the accounting for financial assets under FASB Statements 107 and 115. Note that all investment assets are at market value except the held-to-maturity tax-exempts securities.

The Questions

A. Income from each activity

From the reformulated statement the three components of comprehensive income (after tax) are:

Underwriting	(164.8)
Real estate	(1.6)
Investments	214.2
	<u>47.8</u>

To get after-tax income from underwriting and real estate operations, taxes have been allocated over the before-tax numbers. Corporate expenses have been charged to underwriting; they could be listed separately as a joint cost over all three activities.

B. Valuing the shares

The value of the firm is the sum of the value of the three activities. The market value of the investments is available from balance sheet information; so the value of the firm is:

Market value of net investment assets	(1)
+ Book value of NOA for underwriting and real estate	(2)
+ <u>PV of forecasted ReOI on underwriting and real estate operations</u>	(3)
<u>= Value of Firm</u>	

Component (1):

Value of net investment assets on the balance sheet	14,147.8
Marking held-to-maturity securities to market	<u>138.0</u>
	<u>14,285.8</u>

(Note: the market value at valuation date, September 30, 1999 should be used but, as the balance sheet at that date is not given, market values at December 31, 1998 are used here)

Component (2):

NOA for underwriting and real estate operations

(8,453.4)

Component (3):

The case gives no information that enables forecasting. But a valuation can be made on the basis of the current profitability. Ignore transitory items and focus on core operating income that will persist:

1. Calculate core operating income

Operating income from reformulated statement	(166.4)
Foreign currency translation losses	<u>9.4</u>
Core operating income (after tax)	<u>(157.0)</u>
(Note that translation losses are reported after tax.)	

2. Calculate the cost of capital

This is given as 10.5%, or for a nine-month period, 7.9%.

3. Calculate ReOI

$$\begin{aligned}\text{ReOI} &= -157.0 + (0.079 \times 8,453.4) \\ &= 510.8\end{aligned}$$

4. Value the current ReOI as a perpetuity

$$\begin{aligned}\text{Value of ReOI} &= 510.8 / 0.079 \\ &= 6,465.8\end{aligned}$$

Note that, while Chubb has operating losses, it is generating positive ReOI because of the value produced by negative net operating assets. (See exercise E9.8).

Sum of the three components:

$$\begin{array}{r}
 14,285.8 \\
 -8,453.4 \\
 +6,465.8 \\
 \hline
 12,298.2
 \end{array}$$

Shares outstanding 162.3 million

Value per share \$75.77

So, on the assumption that current core profitability is a good indicator of future profitability, the shares are worth \$78.71. The stock traded at \$50.00: the market sees even worse profitability in the future, or is mispricing the stock. If you see underwriting profitability improving in the future, you must conclude that the stock is undervalued.

Dividing the value over investment and operating activities:

$$\begin{array}{r}
 \text{Value of investments, per share} \quad \$87.91 \\
 \text{Value of operations, per share} \quad - \quad 12.14 \\
 \hline
 \$75.77
 \end{array}$$

Note that the per-share value of the investments is greater than the market price for all the firm (\$50). The market is assigning a negative value to the operations also.

Chubb's share price increased to \$85 by January 1, 2001.

C. How features of the statements featured in the valuation

1 - 3. Because the value of the investment activities are given in the balance sheet, items to do with investment income are not used. The current income flows give no additional information about the value of these assets.

4. Foreign currency translation losses do not affect core operating income, so are not used. They give no indication of future translation gains or losses.

5. Net operating assets, separated, are used to value the two aspects of the operations.

6. Real estate assets are included in NOA for non-investment operations. One could value the real estate and underwriting operations separately if there were a clear distinction of their NOA, as operating income and assets are available for each.

(There is a question as to how corporate expenses might be allocated to activities.)

While real estate assets are listed on the balance sheet, operating liabilities are pooled with accrued expenses and other liabilities.

D. Is Chubb profitable?

No: The operating activities are generating a positive ReOI but the value of the operating activities is negative. Chubb is not creating value for its shareholders from underwriting. Chubb, in common with many other insurers at the time, was giving up value to policyholders. The float (negative NOA) of course provides funds for investment, but at what cost? There is a question, of course, of what the appropriate required return for underwriting is, but the losses on underwriting is making this source of investment funds expensive. Insurers have to be good at both underwriting (in a competitive industry) and investment. Float does not come for free.

E. Residual income on investments

Income on investment assets	214.2
Investment assets	14,147.8

$$\text{ReOI} = 214.2 - (0.07 \times 14,147.8)$$

$$= -776.1$$

A required after-tax return of 7.0% is a guess. The required return should be a weighted average of that on the fixed debt and equities in the investment portfolio.

This is not informative, given we have the market value of the assets. Also it contains transitory elements such as unrealized and realized gains and losses. And possibly cherry picking (see below).

F. The accounting

There are two features of the accounting that warrant investigation:

1. Loan Loss Reserves (Unpaid Claims)

Insurance firms reserve against future claims from policyholders. The unpaid claims reserve was \$10,356.5 million at December 31, 1998 and \$11,826.5 million at September 30, 1999. These are estimates and estimates can be biased. Firms can change estimates to report more or less profit.

2. Cherry Picking

A firm can choose which investments to sell and which to hold. If they sell those with realized gains rather than those with realized losses, they report more income. Note that Chubb had \$82.8 million in realized gains but \$400.3 million in unrealized losses. So the net income figure is not a good indicator of success in investment activities. Rather, comprehensive income should be the focus for it picks up both realized and unrealized gains and losses.

(This discussion does not affect the valuation if balance sheet values, rather than income statement flows, are relied upon.)

G. Recommendation

If the losses in underwriting are seen as continuing, reduce underwriting activities and, as lower investment assets would then be required for reserves,

return cash to shareholders in a stock repurchase. Or make better investment of the float from underwriting (in equities or real estate?) to make up for the underwriting losses.

Regulators (with the interests of the insured in mind rather than the shareholders) may have different ideas, however.

M13.2 Economic Profit and Value Generation: The Coca-Cola Company

The case observes a residual operating income measure (“economic profit”) used in practice.

Question A

According to management’s explanation, economic profit is calculated as:

Income before interest (after tax) – (cost of capital × average capital employed)

We calculate this for 1997.

Income before interest and taxes:

Presumably this is after an allocation of taxes to interest expense and operating income:

Income before taxes		6,055
Interest expense		<u>258</u>
EBIT		6,313
Taxes as reported	1,926	
Tax benefit of interest expense (37%)	<u>95</u>	<u>2,021</u>
Income before interest expense (after tax)		<u>4,292</u>

Capital employed (as defined by Coke):

Shareholders’ equity	7,1
Interest bearing debt	<u>3,1</u>
Capital employed (given in schedule)	<u>11,1</u>
Average for year	<u>10,1</u>

Note that return on capital is reported as 39.4% in Coke’s Selected Financial Data. By our calculations,

$$\begin{aligned}\text{Return on Capital} &= \frac{4,292}{10,928} \\ &= 39.3\%\end{aligned}$$

(which is almost the same).

Economic profit of \$3,325 million in 1997 is calculated as follows:

$$4,292 - (\text{cost of capital} \times 10,928) = 3,325$$

Question B

The cost of capital that solves this equation (to yield economic profit of \$3,325 million) is (approximately) 9%. Put another way,

$$\text{Economic profit} = 3,325 = (39.4\% - 9.0\%) \times 10,928.$$

Question C

Economic profit of \$3,325 million was generated in 1997 by earning 39.4% return on capital, against a required return of 9.0%, on net assets employed of \$10,928 million. Further explanations can be given by decomposing the RNOA into profit margins and asset turnovers and the factors that drive them.

Question D

Coke includes interest income in their operating income measure and financial assets in capital employed. There are considerable financial assets. Make the adjustments to get residual operating income as follows:

Income before interest expense (after tax)	4,292
Interest income after tax (211×0.63)	133
Operating income (after tax)	<u>4,159</u>
Capital employed (as defined by Coke), 1997	11,186
Cash, cash equivalents and marketable securities, 1997	<u>1,843</u>

NOA, 1997 9,343

Capital employed, 1996 10,669

Cash, cash equivalents and marketable securities, 1996 1,658

NOA, 1996 9,011

Average NOA, 1997 9,177

$$\begin{aligned}\text{ReOI} &= 4,159 - (9.0\% \times 9,177) \\ &= 3,333\end{aligned}$$

$$\begin{aligned}\text{RNOA} &= \frac{4,159}{9,177} \\ &= 45.3\%\end{aligned}$$

This RNOA is considerably higher than the return on capital of 39.4% because it does not include the lower return on financial assets.

Question E

(Working this question leads into the analysis of the next chapter.)

$$\begin{aligned}\text{Unlevered P/B} &= \frac{\text{Price of NOA}}{\text{NOA}} \\ &= \frac{\text{Price of Equity} + \text{Net Debt}}{\text{NOA}}\end{aligned}$$

$$\begin{aligned}\text{Price (market value) of equity} &= 23 \text{ times book value} \\ &= 23 \times \$7,311 \text{ million} \\ &= \$168,153 \text{ million}\end{aligned}$$

$$\begin{aligned}\text{Debt (at book value)} &= \$3,875 \text{ million} \\ \text{Financial assets} &\quad \underline{1,843} \\ \text{Net debt} &\quad \underline{\$2,032 \text{ million}}\end{aligned}$$

$$\begin{aligned}\text{Unlevered P/B} &= \frac{168,953 + 2,032}{9,343} \\ &= 18.3\end{aligned}$$

Does the economic profit justify this multiple? Suppose 1997 economic profit were a perpetuity. Then

$$\begin{aligned}\text{Value of equity} &= 7,311 + \frac{3,325}{0.09} \\ &= 44,255 \text{ million (or an unlevered P/B of 6.1)}\end{aligned}$$

At a market valuation of 168,153 million the market sees more growth in economic profit. What growth does it see?

$$168,153 = 7,311 + \frac{3,325 \times g}{1.09 - g}$$

$$g = 1.068 \text{ (or 6.8\% annual growth in economic profit)}$$

The analyst's task is to discover whether this is a reasonable forecast. Past growth certainly has been impressive:

	<u>1997</u>	<u>1996</u>	<u>1995</u>	<u>1994</u>	<u>1993</u>
Growth in economic profit	22.3%	18.6%	20.8%	22.4%	19.2%

Can this level of growth be maintained?

Analyzing and forecasting growth in economic profit is the task of the next two chapters.

M13.3. A Firm with Implied Value of Operations of Zero: Comverse Technology, Inc.

This is the case of a firm that is trading for less than its net cash (net financial assets). Arbitragers usually see this situation as a BUY: if the net cash is more than its market value, one could buy the firm, appropriate the cash (and liquidate the firm) and make a profit. Alternatively, if the operations are valuable as a going concern, one could carry on the operations and make a profit; the market is giving the operations a negative value so is paying the acquirer to take on something of value.

Question A

$$\begin{aligned}\text{Book value per share} &= \$1,652,646/186,981.2 \\ &= \$8.84\end{aligned}$$

Question B

Net Financial Assets (thousands):	
Cash and cash equivalents	\$1,391,705
Bank deposits and S/T investments	415,294
Debentures	<u>(434,000)</u>
 NFA	 <u>\$1,372,999</u>

$$\text{NFA per share} = \$1,372,999/186,981.2 = 7.34$$

Question C

The price of the operations = price of equity – net financial assets

Price of equity	= \$7 × 186,981.2 = \$1,308,868 thousand
Net financial assets	<u>1,372,999</u>

Price of operations	<u>\$ (64,131)</u>
---------------------	--------------------

Net operating assets = Common equity – net financial assets

$$\begin{aligned}&= \$1,652,646 - \$1,372,999 \\ &= \$279,647 \\ \text{Unlevered (enterprise) P/B} &= -64,131/279,647 \\ &= -0.23\end{aligned}$$

The market is giving a negative value to the operations.

Question D

$$\begin{aligned}\text{Equity price/net financial assets} &= 1,308,868/1,372,999 \\ &= 0.95\end{aligned}$$

The equity is trading at less than the value of the net financial assets (“net cash”).

Other Information

This looks like a BUY: one can get the cash for less than the value of the cash and, in addition, get operations that may have some value. It is the latter that is the question,

for one could be taking on liabilities. One needs information to answer the following questions:

- What is the future profit outlook? With earnings down to 2 cents from 15 cents, are the operations going sour? Or can this firm deliver earnings in the future?
- What would be the cost to liquidate the firm to get the cash?
- What is the liquidation value of the net operating assets – the inventories, plant, etc.
- Are there any off-balance-sheet or contingent liabilities?

Postscript:

Comverse Technology (CMVT) was trading at \$15 per share at the end of June, 2003, over 100% higher than the \$7 when the case was written.