

CHAPTER THREE

How Financial Statements are Used in Valuation

Concept Questions

C3.1. Investors are interested in profits from sales, not sales. So price-to-sales ratios vary according to the profitability of sales, that is, the profit margin on sales. Also, investors are interested in future sales (and the profitability of future sales) not just current sales. So a firm will have a higher price-to-sales ratio, the higher the expected growth in sales and the higher the expected future profit margin on sales.

Note that the price-to-sales ratio should be calculated on an unlevered basis.

See Box 3.2.

C3.2. The price-to-ebit ratio is calculated as price of operations divided by ebit. The numerator and denominator are:

Numerator: Price of operations (firm) = price of equity + price of debt

Denominator: ebit is earnings before interest and taxes.

Merits:

The ratio focuses on the earnings from the operations. The price-to-ebit ratio prices the earnings from a firm's operations independently of how the firm is financed (and thus how much interest expense it incurs).

Note that, as the measure prices operating earnings, the numerator should not be the price of the equity but the price of the operations, that is, price of the equity plus the price of the net debt. In other words, the unlevered price-to-ebit ratio should be used.

Problems:

As the measure ignores taxes, it ignores the multiple that firms can generate in operations by minimizing taxes.

A better measure is

Unlevered Price/Earnings before Interest

$$= \frac{\text{Market Value of Equity} + \text{Net Debt}}{\text{Earnings Before Interest}}$$

where

Earnings Before Interest = Earnings + Interest (1 – tax rate). After tax interest is added back to earnings because interest expense is a tax deduction, and so reduces taxes.

C3.3.

Merits:

The price-to-ebitda ratio has the same merits as the price-to-ebit ratio. But, by adding back depreciation and amortization to ebit, it rids the calculation of an accounting measurement that can vary over firms and, for a given firm, is sometimes seen as suspect. It thus can make firms more comparable.

Problems:

- This multiple suffers from the same problems as the price-to-ebit ratio.
- In addition it ignores the fact that depreciation and amortization are real costs. Factories depreciate (lose value) and this is a cost of operations, just as labor costs are. Copyrights and patents expire. And goodwill on a purchase of another firm is a cost of the purchase that has to be amortized against the benefits (income) from the purchase, just as depreciation amortizes the cost of physical assets acquired. The accounting measures of these economic costs may be doubtful, but costs they are. Price-to-ebitda for a firm that is “capital intensive” (with a lot of plant and

depreciation on plant) is different from that of a “labor intensive” firm where labor costs are substituted for plant depreciation costs. So adding back depreciation and amortization may reduce comparability

C3.4. Share price drops when a firm pays dividends because value is taken out of the firm. But current earnings are not affected by dividends (paid at the end of the year). Future earnings will be affected because there are less assets in the firm to earn, but current earnings will not. A trailing P/E ratio that does not adjust for dividend prices earnings incorrectly. A P/E ratio that adjusts for the dividend is:

$$\text{Adjusted trailing P/E} = \frac{\text{Price per share} + \text{Annual Dps}}{\text{Eps}}$$

C3.5.

$$P/S = \frac{P}{E} \times \frac{E}{S} = 12 \times 0.06 = 0.72$$

C3.6. By historical standards, a multiple of 25 is a high multiple for a P/E ratio, and is an extremely high price-to-sales ratio if only 8% of each dollar of sales ends up in earnings. Either the market is expecting exceptional sales growth (and thus exceptional earnings despite the margin of 8%), or the stock is overvalued.

C3.7. Traders refer to firms with high P/E and/or high P/B ratios as *growth stocks*, for they see these firms as yielding a lot of earnings growth. They see prices increasing in the future as the growth materializes. The name, *value stocks* is reserved for firms with low multiples, for low multiples are seen as indicating that price is low

relative to value. A *glamour stock* is one that is very popular due to high sales and earnings growth (and usually trades at high P/S and P/E ratios).

C3.8. Yes. In an asset-based company (like Weyerhaeuser) most of the assets (like timberlands) are identified on the balance sheet and could be marked to market to estimate a value. For a technology firm (like Dell), value is in intangible assets (like its direct-to-customer marketing system) that are not on the balance sheet. Indeed, they are nebulous items that are not only hard to measure but also hard to define. How would one define Dell's direct-to-customer marketing system? How would one measure its value?

C3.9. Yes. The value of a bond depends on the coupon rate because the value of the bond is the present value of the cash flows (including coupon payments) that the bond pays. But the yield is the rate at which the cash flows are discounted and this depends on the riskiness of the bond, not the coupon rate. Consider a zero coupon bond – it has no coupon payment, but a yield that depends on the risk of not receiving payment of principal.

C3.10. Yes. Dividends reduce future eps: with fewer assets in the firm, earnings are lower but shares outstanding do not change. A stock repurchase for the same amount as the dividend reduces future earnings by the same amount as the dividend, but also reduces shares outstanding.

But firms should not prefer stock purchases for these reasons because the change in eps does not amount to a change in value. See the next question. Shareholders may prefer stock repurchases if capital gains are taxed at a lower rate than dividend income.

C3.11. No. Dividends reduce the price of a firm (and the per-share price). But shareholder wealth is not changed (at least before the taxes they might have to pay on the dividends) because they have the dividend in hand to compensate them for the drop in the share price. In a stock repurchase, total equity value drops by the amount of the share repurchase, as with the dividend. Shareholders who tender shares in the repurchase are just as well off (as with a dividend) because they get the cash value of their shares. The wealth of shareholders who did not participate in the repurchase is also not affected: share repurchases at market price do not affect the per-share price. So share repurchases do not create value for any shareholders.

Subsequent eps are higher with a stock repurchase than with a dividend (as explained in the answer to question C3.10). Shareholders who tendered their shares in the repurchase earn from reinvesting the cash received, as they would had they received a dividend. Shareholders who did not tender have lower earnings (because assets are taken out of the firm) but higher earnings per share to compensate them from not getting the dividend to reinvest.

C3.12. No. Paying a dividend actually reduces share value by the amount of the dividend (but does not affect the cum-dividend value). Shareholders are no better off, cum-dividend. Of course, it could be that firms that pay higher dividends are also more profitable (and so have higher prices), but that is due to the profitability, not the dividend.

C3.13. This question involves a stock repurchase, a dividend cut, and borrowing.

- The share repurchase should not affect the per-share price.

- The dividend cut will result in higher share prices in the future (as no dividends will be paid out), but the current price should not be affected.
- Issuing debt should not affect equity value if the debt is issued at market value (the bank charges market interest rates): the debt issue is a zero-NPV transaction.

In sum, the transaction should not affect the per-share price of the equity for it involves financing transactions that are irrelevant for equity value. In fact, Reebok's stock price stayed at around \$35 during this period.

We will return to financing and value creation later in the book and will also be looking more closely at Reebok's financial statements and this transaction. This specific example of Reebok's stock repurchase in August 1996 is analyzed in Chapter 13.

Exercises

E3.1. Identifying Firms with Similar Multiples

This is a self-guided exercise.

E3.2. A Stab at Valuation Using Multiples: Biotech Firms

Multiples of the various accounting numbers for the five firms can be calculated and the average multiple applied to Genentech's corresponding accounting numbers. This yields prices for Genentech:

<i>Multiple</i>	<i>Comparison Firm Mean</i>	<i>Estimated Genentech Value (millions)</i>
P/B	4.16	\$5,610.9
E/P	.0245*	5,077.6
(P-B)/R&D	10.66	4,699.2
P/Revenue	6.05	4,809.0
Mean over all values		5,049.2

*Excludes firms with losses.

E/P is used rather than P/E because a very high P/E due to very small earnings can affect the mean considerably. The mean E/P also excludes the loss firms since Genentech did not have losses.

Research and development (R&D) expenditures are compared to price minus book value. As the R&D asset is not on balance sheets, its missing value is in this difference. The average ratio of 10.66 is applied to Genetech's R&D expenditures to yield a valuation for its R&D asset of \$3,350.4 million which, when added to the book value of the other net assets, gives a valuation of \$4,699.2 million for Genentech. This is clearly very rough.

The average of the values based on the mean multiples is \$5,049.2 million. Genetech's actual traded value in April 1995 was \$5,637.6 million.

E3.3. A Stab at Equity Valuation Using Multiples: Automobiles

The exercise applies the method of comparables. It also introduces you to the calculation of P/E and price-to-book ratios and the effects of dividends on both.

(a)

	1992			1993		
	P/E	P/B	d/P	P/E	P/B	d/P
Daimler-Benz AG (NYSE)				76.6	2.2	.165
Federal Signal Corp (NYSE)	21.7	4.1	.020	24.8	4.8	.017
Ford Motor of Canada Ltd. (AMEX)	---	1.3	.000	---	2.40	.000
Ford Motor Corp. (NYSE)	---	1.4	.037	14.5	2.1	.025
General Motors Corp. (NYSE)	---	3.8	.043	27.5	7.1	.015
Honda Motor Ltd. (NYSE)	38.4	1.4	.009	69.5	1.7	.008
Navistar Intl. (NYSE)	---	5.1	.000	---	3.8	.000
Paccar Inc.	30.3	1.9	.023	14.5	1.9	.000
Mean	30.1	2.7	.019	37.9	3.3	.029
Chrysler						
Estimated	65-7/8	68-7/8	31-1/2	---	63-3/4	22-3/8
Actual	32-1/4	32-1/4	32-1/4		53-1/4	53-1/4

Note: $P/E = (\text{price} + \text{dps})/\text{eps}$

Estimated price $(P/E) = (\text{mean } P/E \times \text{eps}) - \text{dps}$

(b) Calculation problems:

- Effects of one large number --e.g., the “outlier” P/E for Daimler-Benz in 1993.
- Should one use (P/E, P/B, P/d or (E/P, B/P, d/P)?

Using the inverse of pricing multiples reduces effects of outliers. For P/d, multiples can be very large, so use d/P (“dividend yield”).

- Losses for the matched firms or the target firms are a problem with P/E calculations. Should one include them? They have been excluded in the mean P/E calculation above because they are very large losses relative to price in most cases.

If the target firm has losses, a positive P/E calculation is useless as price can’t be negative.

- iv. Each method gives a different price. How does one combine these prices into one price?
- v. Does using dividends to price make much sense? Dividends are determined by payout (or retention) objectives and these may not be related to value. (Compare Daimler-Benz and Navistar in 1993).
- vi. The P/E and P/B will be determined by accounting methods (for earnings and book value). What if firms' methods differ?

In this respect, the big losses in 1992 were due in part to these firms recognizing the effects of the new FASB Statement 106 accounting for OPEB in that year.

Accounting methods vary across countries, with those in Japan and Germany being particularly different from U.S. GAAP accounting. The inclusion of Daimler-Benz and Honda in the analysis is thus suspect.

- (c) See the note in (a). Dividends affect price but not earnings, so P/E reflects payout. To get a P/E that is insensitive to payout calculate it as in (a).
- (d) Dividends affect price and book value by the same amount: a dollar of dividends reduces price by a dollar and also book value by a dollar. Therefore the difference, $P - B$, the "premium" over book value, is unaffected. However the ratio, P/B will be affected unless it happens to be 1.0.

E3.4. Pricing Multiples: IBM

Market Value = 1.83 billion shops \times \$125 = \$228.75 billion

Book value of equity (for a P/B of 12.1) 18.90 billion

Debt (for debt-to-equity ratio of 0.76) 14.37 billion

$$\text{Debt} = \text{Price} \times \frac{B}{P} \times \frac{D}{E}$$

E3.5 Pricing Multiples: Procter & Gamble

$$P/E = \frac{P}{S} \times \frac{S}{E} = 3.5 \times \frac{1}{0.099} = 35.4$$

E3.6. Measuring Value Added

(a) Buying a stock:

Value of a share = $\frac{2}{0.12} =$	\$ 16.67
Price of a share	19.00
Value lost per share	<u>\$ 2.33</u>

(b) Value of the investments:

Present value of net cash flow of \$1M per year for five years (at 9%)	\$ 3.890 million
Initial costs	<u>2.000</u>
Value added	<u>\$ 1.890 million</u>

E3.7. Converting a Price to a Forecast: Charles Schwab

The required sales to support Schwab's market value is the market value divided by the price-to-sales ratio:

Market value	\$56 billion
P/S ratio	1.5
Sales	\$37.333 billion
Commission rate	0.0025
Dollar volume of trading:	$\frac{37.333}{0.0025}$ \$14.933 trillion

Is this reasonable? Hardly. The implied volume of trading is greater than the total annual trading volume on the NYSE.

E3.8. Price-to-Earnings Forecasts and Value: Microsoft Corporation

Forecasted price in June, 2000 = $72 \times \$1.56 = \112.32

Present value (in June, 1999) at 13% = $\frac{112.32}{1.13} = \$99.40$
(No-arbitrage price)

Trading at \$80, Microsoft is undervalued by these estimates. But can it maintain a P/E ratio of 72?

E3.9. Forecasting Prices in an Efficient Market: Weyerhaeuser Company

This tests whether you can forecast future prices, ex-dividend, using the no-arbitrage relationship between prices at different points in time.

The T-Bill rate at the end of 1995 was 5.5%.

So the CAPM cost of capital = 5.5% + (1.0 × 8.0%) = 13.5% (using an 8% risk premium).

$$\begin{aligned}
 (a) \quad \bar{P}_{1997} &= \rho^2 P_{1995} - \rho \bar{d}_{1996} - \bar{d}_{1997} \\
 &= (1.135^2 \times 42) - (1.135 \times 1.60) - 1.60 \\
 &= 50.69
 \end{aligned}$$

This is the ex-dividend price.

$$\begin{aligned}
 (b) \quad \bar{P}_{1997} &= \rho^2 P_{1995} \\
 &= 1.135^2 \times 42 \\
 &= 54.11
 \end{aligned}$$

This is the cum-dividend price.

E3.10. Valuation of Bonds and the Accounting for Bonds, Borrowing Costs, and Bond Revaluations

The purpose of this exercise is to familiarize students with the accounting for bonds.

The cash flows and discount rates:

	1994	1995	1996	1997	1998	1999	
		40	40	40	40	40	Coupon
						1000	
Redempt.							
rate		1.08	1.1664	1.2597	1.3605	1.4693	Discount

(a) Present value of cash flows = value of bond = \$840.31.

(b) (i) Borrowing cost = $\$840.31 \times 8\% = \67.22 per bond

(ii) This is the way accountants calculate interest (the effective interest method):

\$67.22 per bond will be recorded as interest expense. This will be made up of the coupon plus an amortization of the bond discount. The amortization is $67.22 - \$40.00 = \27.22 . This accrual accounting records the effective interest, not the cash flow.

(c) (i) As the firm issued the bonds at 8%, it is still borrowing at 8%.

(ii) Interest expense for 1996 will be \$69.40 per bond. This is the book value of the bond at the end of 1995 times 8%: $\$867.53 \times 8\% = \69.40 . The book value of the bond at the end of 1995 is $\$840.31 + \$27.22 = \$867.53$, that is, the book value at the beginning of 1995 plus the 1995 amortization.

(d) The cash flows from the end of 1996 onwards:

1997	1998	1999	
----- ----- -----			
40	40	40	Coupon
		1000	Redemption
1.08	1.1664	1.2597	Original Discount rate
1.06	1.1236	1.1910	New discount rate

Present value of remaining cash flows at 8% discount rate = \$896.92

Present value of remaining cash flows at 6% discount rate = 946.55

Price appreciation \$ 49.63

(i) The bonds are marked to market so they are carried at \$946.55. Note that bonds are marked to market only if they are assets, not if they are liabilities. Debtor Corporation's carrying amount would not be affected by the change in yield.

(ii) The interest income in the income statement will be as before, \$69.40 per bond. However, an unrealized gain of \$49.63 per bond will appear in other comprehensive income to reflect the markup.

Note that, for the answer to (c)(i), if Debtor Corporation had sold the bonds at the end of 1996 (for \$946.55 each) it would have realized a loss which would be reported with extraordinary items in the income statement. If it refinanced at 6% for the last three years, it would lower borrowing costs that, in present value terms, would equal the loss.

E3.11. Share Issues and Market Prices: Is Value Generated or Lost By Share

Issues?

This exercise tests understanding of a conceptual issue: do share issues affect shareholder value per share? The understanding is that issuing shares at market price does not affect the wealth of the existing shareholders if the share market is efficient: New shareholders are paying the “fair” price for their share. However, if the shares are issued at less than market price, the old shareholders lose value.

(a)	Total value of equity prior to issue	=	158 million × \$55	=	\$ 8.69B
	Value of share issue	=	<u>30 million</u> × \$55	=	<u>1.65B</u>
	Total value of equity after share issue				<u>10.34B</u>
	Shares outstanding after share issue	=	<u>188 million</u>		
	Price per share after issue	=			<u>\$55</u>

Like a share repurchase, a share issue does not affect per share value as long as the shares are issued at the market price. Old shareholders can't be damaged or gain a benefit from the issue. Of course, if the market believes that the issue indicates how insiders view the value of the firm, the price may change. But this is an informational effect, not a result of the issue. Old shareholders would benefit if the market were inefficient, however. If shares are issued when they are overvalued in the market, the new shareholders pay too much and the old shareholders gain.

The idea that share issues don't generate value (if at market prices) is the same idea that dividends don't generate value. Share issues are just dividends in reverse.

(b)	Total value of equity prior to exercise	=	188 million × 62	=	\$11.66B
	Value of share issue through exercise	=	<u>12 million</u> × 30	=	<u>0.36B</u>
	Total value of equity after exercise				<u>12.02B</u>
	Shares outstanding after exercise		<u>200 million</u>		
	Price per share				<u>\$60.10</u>

The (old) shareholders lost \$1.90 per share through the issue: issue of shares at less than market causes “dilution” of shareholder value.

E3.12. Stock Repurchases and Value: J.C. Penney Company

This exercise makes the same conceptual point as the previous exercise on stock issues: stock repurchases (which are reverse stock issues) don't create value, if the market price is at fair value.

There is no effect on the price per share at the date of repurchase. The total value of the company (price per share x shares outstanding) would drop by \$335 million, the amount of cash paid out. But the number of shares outstanding would also drop by 7.5 million leaving the price per share unchanged.

Price per share before repurchase	=	$\$M335/7.5M$	=	44.67
Total value of the equity before repurchase	=	$\$44.67 \times 227.4M$	=	
				\$M10,157
Total value of the equity after repurchase	=	$\$M10,157 - \$M335$	=	
				\$M9,822
Shares outstanding after repurchase	=	$227.4M - 7.5M$	=	219.9M
Price per share after repurchase	=			\$44.67

Note: the announcement of a share repurchase might affect the price per share if the market inferred that the management thinks the shares are underpriced. That is, the repurchase might convey information. But the actual repurchase itself will not affect the per-share price. If the shares are not priced efficiently in the market, value will be gained (or lost) for shareholders who do not participate in the repurchase.

E3.13. Dividends, Stock Returns, and Expected Payoffs: Weyerhaeuser Company

If no dividends are to be paid, the expected 1997 price would be higher by the amount of the terminal value of the dividends.

Terminal value in 1997 of 1996 dividend = $\$1.60 \times 1.135 =$

\$1.816

Terminal value in 1997 of 1997 dividend =

1.600

\$3.416

Ex-dividend price, 1997

\$50.690

Cum-dividend price

\$54.106

[See Exercise E3.5 in Chapter 3]

Stock repurchases have no effect on per-share price so the expected price would be the cum-dividend price of \$54.11.

This conclusion ignores any "signaling effect" from the announcement of the stock dividend and any differences in tax effects between capital gains at dividends.

E3.14 Dividend Payoffs and Value

This exercise applies the dividend discount model over a horizon of ten years to emphasize the "horizon problem."

These cash payoffs are per dollar of stock price at time 0. The present value of the dividend stream at a 10% discount rate is 87.18 cents. So a dollar spent on stocks delivered only 87.18 cents in present value over nine years. The holding period would have to be much longer to justify the value paid in cash payoffs.

Note: One sees cash payoffs from share repurchases and liquidations ex post (after the fact). But predicting these in advance (ex ante) is tricky: they usually come as surprises. Cash dividends are much easier to forecast but this component of the total cash payoff is small (and forecasting them to value a firm would typically require forecasts over very long periods)

E3.15. Betas, the Market Risk Premium, and the Equity Cost of Capital: Sun Microsystems

a) The CAPM equity cost of capital is given by

$$\text{Cost of capital} = \text{Risk-free rate} + (\text{Beta} \times \text{Market risk premium})$$

$$= 5.5\% + (1.38 \times ?)$$

Market Risk	<u>Cost of</u>
Premium	<u>Capital</u>
4.5%	11.71%
6.0%	13.78%
7.5%	15.85%
9.0%	17.92%

b)

Market Risk	Beta	Cost of Capital
Premium		
4.5%	1.25	11.13%
	1.55	12.48%
6.0%	1.25	13.00%
	1.55	14.80%
7.5%	1.25	14.88%
	1.55	17.13%
9.0%	1.25	16.75%
	1.55	19.45%

c) Lowest cost of capital: 11.13%

Highest cost of capital: 19.45%

Forecasted price in June 2000 = $\$2.10 \times 67 = \140.70

Present value at 11.13% (no dividends) = $\frac{\$140.70}{1.1113} = \126.61

Present value at 19.45% (no dividends) = $\frac{140.70}{1.1945} = \117.79

E3.16. Implying the Market Risk Premium: Procter & Gamble

The CAPM cost of capital is given by

Cost of Capital = Risk-free rate + (Beta \times Market risk premium)

$11.9\% = 5.5 + (0.78 \times ?)$

$? = 8.2\%$

Minicases

M3.1 An Arbitrage Opportunity? Cordant Technologies and Howmet International

Background

This case was written at a time when some commentators insisted that, while multiples for many new technology stocks were unusually high, bargains could be

found among older manufacturers that relied on physical assets rather than knowledge assets. At a time when the market was overexcited about knowledge-based firms, these firms were seen as neglected, and neglected stocks are often suspected of being underpriced.

The Arbitrage Opportunity

The arbitrage opportunity here comes from the relative prices of Cordant and Howmet. Cordant is valued at \$1.17 billion. But it holds 85% of the shares in Howmet. As Howmet's market value is \$1.40 billion, this stake is worth \$1.19 billion. So, buying Cordant's shares at their current price of \$32 pays for the 85% of Howmet. The rest of Cordant's business is free! Or so it would seem (because arbitrage is risky).

This situation where a parent company's price is less than the price of its investment in a subsidiary is referred to one of negative stub value. A stub value is defined as the market value of the parent's equity minus the market value of the investment in the subsidiary and the value of other net assets of the parent. See the commentary on negative stub values on the web page for Chapter 3.

The case asks for a comparison of pricing multiples:

Cordant Howmett

P/B	4.1	3.3
Rolling P/E	7.8	11.6
P/Sales	0.5	1.0
Leading P/E (2000)	7.5	10.3

Howmet traded at a considerably higher P/E and P/S than Cordant, despite both having very similar businesses. But Howmet's price-to-book ratio was lower than Cordant's. This suggests that Cordant's earnings and sales are underpriced relative to Howlett's.

The Trading Strategy

One could buy Cordant, thinking it was underpriced. But what if it was appropriately priced and Howmet was overpriced? The better strategy would be to go long in Cordant and short Howmet, with the (Scenario A) conjecture that their multiples must converge and the apparent arbitrage opportunity disappear. In so doing, one does not judge which firm is mispriced; rather the position works on the relative pricing of the two firms.

Another arbitrage opportunity that is worthy of investigation involves shorting the new-tech stocks (with high multiples) and buying old-tech stocks (with low multiples) such as Cordant. As it turned out, this strategy, executed in October 1999, would have been very successful, but with most of the gain coming from the fall in prices of the high multiple firms. (See Minicase 3.2.)

The apparent arbitrage situation would not have lasted so long a decade before. Then the arbs quickly discovered these opportunities, and indeed sometimes raided the firms and split them up to realize their value. But such “plays” were not as common in the late 1990s, the focus having shifted to betting on the high-tech sector.

(Maybe the arbs got stung?) So similar situations presented themselves. Limited, the clothing retailer held an 84% stake in Intimate Brands (makers of Victoria's Secret and Bath & Body Works) at a market value that was more than Limited's own total market value. Limited was seen to be "out of favor" with analysts. Refer also to the case of Palm and 3Com on the Chapter 3 web page discussion of negative stub values.

A firm in this situation can arbitrage the opportunity for shareholders by distributing the shares in the subsidiary to shareholders. (There may be tax consequences, however, and the firm should look for a favorable tax ruling that makes the transaction tax-free.)

Arbitrage Risk

Is this strategy risk-free? No: an arbitrage position could go against you. The two firms' fortunes could go the other way. They are similar and so are subject to the same risk factors, but they surely have some features that affect them differently. Also, while betting on Scenario A, Scenario B could take over and drive prices further apart. Holding a short position may be a bumpy ride if prices move against the position.

Refer to the discussion on risk in arbitrage on the web page for Chapter 3. Refer also to the discussion on hedging risk.

The investor could reduce the risk in the strategy by analyzing the two firms' prospects. Which is overvalued, which is undervalued relative to these prospects? Is there any rationale for the difference in pricing? What explains the different price-to-book ratios? (Later analysis in the book will be relevant to answering this question.)

In this respect, the analysts' forecasts, if they are to be believed, are reassuring: analysts don't see a big drop in earnings for either firm, and the differences between P/E ratios apply to leading P/E ratios also.

The Resolution

Cordant was acquired by Alcoa Inc. for \$57 a share in cash in 2000. This is a considerable amount over the \$37 a share at the time when the case was written in October 1999. Alcoa of course got the 85% in interest in Howmet.

M3.2. Nifty Stocks? Returns to Stock Screening

Introduction

This case is self-guiding case. It was written in October 1999 with no idea of the outcome, but with a good guess: those who forget the lessons of history are deemed to repeat it.

You might refer to the 1970s experience as background:

IBM dropped 80% over 1969-70

Sperry Rand dropped 80% over 1969-70

Honeywell dropped 90% from its peak

NCR dropped 85% from its peak

Control Data dropped 95% from its peak

Notice something about these stocks? They were the “new technology” stocks of the time. Remember those firms whose names ended in “onics” and “tron” rather than “.com”?

Over the 10 years of the 1970s, the Dow stocks earned only 4.8% and ended 13.5% down from their 1960’s peak.

Use the case to reinforce the point that the analyst needs a good sense of history against which to judge the present. History provides benchmarks.

Subsequent Prices and P/E ratios

Here are split-adjusted prices and P/E ratios in July 2001 for the nifty firms listed in the case, along with percentage price changes from the prices in September 1999 given in the case.

<i>P/E</i>	<i>Price per Share</i>	<i>Price Change</i>
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Microsoft	40	71	-21.1%
Dell Computer	27	36	-18.2%
Lucent Technologies	neg. earnings	6	-90.6%
America Online	94	89	-14.4%
Analog Devices	24	78	39.3%
Mattel	42	19	-9.5%
CBS	Acquired		
Cisco Systems	neg. earnings	17	-75.0%
Home Depot	45	74	7.2%
Motorola	neg. earnings	53	-39.1%
Charles Schwab	45	23	-32.4%
Time Warner	Acquired		

(The price changes ignore any dividends that were received. These dividends should be added to calculate returns.)

The corresponding numbers for the less nifty stocks are:

	<i>P/E</i>	<i>Price per Share</i>	<i>Price Change</i>
Centex	9	47	67.9%
ITT Industries	15	44	37.5%
Seagate Technology	Acquired		
US Airways	neg. earnings	18	-30.8%
Conseco	neg. earnings	15	-25.0%
Hilton Hotels	4	14	40.0%

The Lesson

History does seem to have repeated itself. Most of the Nifty Fifty of the 1990s dropped significantly. The results for the low multiple firms were mixed, but overall in the direction expected. (One has to be careful about what happened to the firms that were acquired: what was the acquisition payoff price?)

High or low multiples suggest trading strategies. But beware; screening on multiples can lead to trading with someone who has done their homework. Multiples can be high or low for legitimate reasons. Indeed, a firm with a high multiple can be underpriced and one with a low multiple can be overpriced. Fundamental analysis tests the mispricing conjecture.

Stocks for the Long Run?

Jeremy Seigel, in his 1994 Irwin book, *Stocks for the Long Run* calculated that an investor buying the Nifty Fifty in 1972 would have suffered in the short run, but would have earned nearly the same returns (12%) over the subsequent 20 years as the S&P 500. Adjusted for risk, the returns were a little less. Long-term winners included the pharmaceuticals, Pfizer and Merck, and Coca Cola and Gillette. The returns on these stocks would have been considerably enhanced had the investor waited to buy after the fall in the mid-1970s, however. Other stocks such as Polaroid, Baxter International, and Flavors & Fragrances did poorly.

M3.3. What is the Value of the Big Board?

Applying a multiple of market value of securities traded:

ASX multiple of price to market value of shares traded =

$$\frac{780 \text{ million}}{650 \text{ billion}} = .0012$$

$$\begin{aligned} \text{Implied price of NYSE} &= .0012 \times \$12.7 \text{ trillion} = \\ \$15.24 \text{ billion} \end{aligned}$$

Applying a multiple of earnings:

$$\text{ASX P/E ratio} = \frac{780 \text{ million}}{24.4 \text{ million}} = 32$$

$$\text{Implied price of NYSE} = 32 \times \$101.3 = \underline{\$3.24 \text{ billion}}$$

Applying a multiple of revenues

$$\text{ASX price-to-revenue} = \frac{780 \text{ million}}{145 \text{ million}} = 5.4$$

$$\text{Implied price of NYSE} = 5.4 \times 728.7 = 3.93 \text{ billion}$$

Which multiple should be used?

Why does NYSE produce lower revenues and earnings from a much higher market capitalization of securities traded?

Daily trading volume would seem like a better measure to use in the comparisons, rather than total market value of securities traded.

NYSE has other interests, in the National Securities Clearing Corporation, the Depository Trust Company and the Options Clearing Corporation. Its brand name should give it a higher multiple than the ASX. And it appeals to a global market, whereas ASX is a regional exchange. But how are these factors quantified? Should they not show up in revenue and earnings? Would floating the NYSE bring new efficiencies (from a different governance structure)?

M3.4. Attempting Asset-Based Valuation: Weyerhaeuser Company

Introduction

This case impresses the student with the difficulties of asset-based valuation. It also tests their knowledge of typical assets on a balance sheet and how close to market value accountants measure them. Use the case to illustrate

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asset-based valuation, but also use it to review the accounting for balance sheet items. Introduce FASB statements No. 107 and 115 that deal with marking to market. Review the accounting for equity investments. Also raise accounting "quality" issues, about the net carrying value for receivables, for example. Review the quasi-mark-to-market for pension liabilities.

The issue can be couched as one of estimating the premium over book value by using asset-based valuation methods. Weyerhaeuser reported a book value of \$4,526 million on its 1998 balance sheet but, at \$54 for each of the 199.009 million shares, its equity traded at \$10,746 million, or at a premium of \$6,220 million (a P/B ratio of 2.37). This premium is value that is not on the balance sheet. Can asset-based methods get a grip on the number? Or should the analyst estimate the premium by forecasting with residual income methods? Use the case to set up the idea of estimating premiums.

Working the Case

A. Listing assets and liabilities that are likely to be close to market value

Assets and liabilities that are probably close to market value are below.

The dollar amounts combine "Weyerhaeuser" and "real estate" numbers.

Cash and short-term investments	\$35 million
Receivables	967
Prepaid expenses	294
Mortgage related instruments	119
Notes payable	(569)
Accounts payable	(699)
Accrued liabilities	(707)
Long-term debt, including current maturates	(4,186)
Pension liabilities	(488)
Other liabilities	<u>(255)</u>
Net assets at market value	<u>\$ (5,489)</u>

Question the quality of the net receivables, accrued liabilities and the pension liabilities. The analyst should read Note 1 to the financial statements that discloses, among other accounting policies, how assets and liabilities are measured. You will find there that equity investments in joint ventures are measured using the equity method, not at market value. Real estate assets are at the lower cost or fair value. Debt is usually close to market value, except when it is fixed-rate debt and interest rates have changed considerably.

Note that most of the items that are close to market value are debt, as is typical, giving the negative total of \$5,489 million above. This means that considerably more value has to be estimated over the \$6,220 premium, that is, $\$6,220 + \$5,489 = \$11,709$ million. This amount is largely the premium on the operating assets.

The fair value of financial instruments is given in the “fair value” footnote, Note 13, as required by FASB statement No. 107:

Dollar amounts in millions	December 27, 1998		December 28, 1997	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Weyerhaeuser; Financial liabilities:				
Long-term debt (including current maturates)	\$3,485	\$3,820	\$3,500	\$3,859
Real estate and related assets:				
Financial assets:	53	58	64	74
Mortgage loans receivable				
Mortgage-backed certificates and other pledged financial instruments	66	69	109	117

Total financial assets	<u>119</u>	<u>127</u>	<u>173</u>	<u>191</u>
Financial liabilities:				
Long-term debt (including current maturities)	<u>701</u>	<u>718</u>	<u>1,032</u>	<u>1,044</u>

These fair values might be been used above rather than the carrying values.

Parts B and C. Attempting asset-based valuation

Value of timberlands

	<u>Acres</u>	<u>Price/acre</u>	<u>Value</u>
South	3.3 million	\$1,000	\$3,300 million
Pacific Northwest	2.0	\$2,000	<u>4,000</u>
			\$7,300

Replacement value of plant

Pulp, etc.	\$12,500	
Wood products	<u>\$2,100</u>	\$14,600

Real estate assets

7 times pre-tax earnings on income statements	= 7 x \$131 million (from income statement)	<u>917</u>
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Value of assets not at market value on balance sheet \$22,817 million

Value of net assets at market value on balance sheet (5,489)

Value of equity \$17,328 million

Shares outstanding 199.009 million

Value per share \$87.07

Current share price \$54.00

Intrinsic premium \$17,328 - \$4,526 \$12,802

(The \$131million for real estate income is the total of items in the two sections for real estate and related assets in the income statement.)

D. Reservations about the valuation:

- Investments in affiliates have not been valued. One could get the market price of the shares of these firms if available (but are they efficient prices?)
- Replacement cost is the current market cost of replacing the assets while maintaining the current productive capacity. But is it value in use? Asset values are firm specific; the value of the assets in use to Weyerhaeuser may be different to the market value.
- The market value of real estate assets is not available. Capitalizing earnings by a multiple captures the value of assets that are earning only. The multiple of 7 used here is a standard industry multiple. If the firm has land that is not earning, this should also be valued. It also might be that the market value of the real estate is different from its capitalized-earnings value.
- Do market values reflect the assets' strategic value? Another firm might pay more (or less) in a takeover if the assets are important to its strategy. Weyerhaeuser might have a strategy that will add to the market value of the assets. (In 2001, it made a bid for Willamette Industries, for example).
- Are market values reliable? Where does the per-acre value of timberlands come from?
- The synergistic use of assets together is not valued. The value of a business comes from using assets together under a business model, by combining entrepreneurial ideas with investments in assets. So summing up the values of individual assets is a doubtful.

Further Discussion

The valuation is in excess of the market value of the equity, \$87 per share versus a market price of \$54. This raises an important question. Does this mean that the firm should be broken up and parts sold off to add value for shareholders? Buy the firm for \$54 per share and sell the assets off for a payoff of \$87 per share.

Comparing break-up value to going-concern value would seem like a worthy exercise. That is, when valuing a firm one should always compare the going concern valuation with the break-up valuation. Valuation is made for a particular strategy, and continuing a business and breaking it up are different strategies.

For break-up valuation, one would use selling (liquidation) prices in the mark-to-market exercise. Selling prices for plant, for example, would presumably be different from replacement cost (buying prices).