

# 7



## SOLUTIONS TO PROBLEMS

P7.1 From abbreviated financial statements (dollars in *millions*)

### Liquidity

$$\begin{aligned} (1) \text{ Net working capital} &= \text{Current assets} - \text{Current liabilities} \\ &= \$150 - \$100 = \$50 \\ (2) \text{ Current ratio} &= \text{Current assets/Current liabilities} \\ &= \$150/\$100 = 1.50 \end{aligned}$$

### Activity

$$\begin{aligned} (3) \text{ Total asset turnover} &= \text{Sales/Total assets} \\ &= \$500/\$350 = 1.43 \end{aligned}$$

### Leverage

$$\begin{aligned} (4) \text{ Debt-equity ratio} &= \text{Long-term debt/Stockholder's equity} \\ &= \$50/\$200 = 0.25 \\ (5) \text{ Times interest earned} &= \text{Earnings before interest and taxes/ interest} \\ &= \$65/\$10 = 6.50 \end{aligned}$$

### Profitability

$$\begin{aligned} (6) \text{ Net profit margin} &= \text{Net profits after taxes/Sales} \\ &= \$35/\$500 = 7.0\% \\ (7) \text{ Return on total assets} &= \text{Net profits after taxes/Total assets} \\ &= \$35/\$350 = 10.0\% \\ (8) \text{ Return on equity} &= \text{Net profits after taxes/Stockholders' equity} \\ &= \$35/\$200 = 17.5\% \end{aligned}$$

### Common Stock Ratios

$$\begin{aligned} (9) \text{ Earnings per share} &= \frac{(\text{Net profits after taxes} - \text{Preferred dividends})}{\text{Number of shares of common stock outstanding}} \\ &= \frac{\$35 - 0/10}{10} = \$3.50 \text{ per share} \\ (10) \text{ Price/Earnings ratio} &= \text{Share price/EPS} \\ &= \$75/\$3.50 = 21.43 \text{ times} \\ (11) \text{ Price-to-Sales ratio} &= \text{Share price/Sales per share} \end{aligned}$$

(12) Dividends per share	=	$\frac{\$75}{(\$500/10)}$	=	1.50
	=	$\frac{\text{Total common dividends paid/}}{\text{Common shares outstanding}}$		
(13) Dividend yield	=	$\frac{\$10}{10}$	=	\$1.00 per share
	=	$\frac{\text{Dividends per share/Share price}}{\text{Share price}}$		
(14) Payout ratio	=	$\frac{\$1.00}{\$75}$	=	1.33%
	=	$\frac{\text{Dividends per share/EPS}}{\text{EPS}}$		
(15) Book value per share standing	=	$\frac{\$1.00}{\$3.50}$	=	29%
	=	$\frac{\text{Common equity/}}{\text{Common shares out-}}$		
(16) Price-to-book value	=	$\frac{\$200}{10}$	=	\$20
	=	$\frac{\text{Share price/Book value per share}}{\text{Book value per share}}$		
	=	$\frac{\$75}{\$20}$	=	\$3.75



P7.2 a. EPS =  $\frac{\text{Net profits after taxes} - \text{Preferred dividends}}{\text{Number of common shares outstanding}}$

For Amherst:  
 EPS =  $\frac{\$10,000,000 - \$0}{2,500,000}$  = \$4 per share

(Note: Only preferred dividends, zero here, are subtracted from net profits after taxes. Common dividends are part of EPS.)

b. Book value per share =  $\frac{\text{Stockholders' equity}}{\text{number of common shares outstanding}}$

For Amherst:

Book Value per share =  $\frac{\$45,000,000}{2,500,000}$  = \$18.00 per share

Price-to-book value =  $\frac{\text{Market price of common stock}}{\text{book value per share}}$

For Amherst:

Price-to-Book value =  $\frac{\$20.00}{\$18.00}$  = 1.11

c. Price/earnings (P/E) ratio =  $\frac{\text{Market price of stock}}{\text{EPS}}$

For Amherst:

P/E =  $\frac{\$20}{\$4}$  = 5 times

d. Net profit margin =  $\frac{\text{net profit after taxes}}{\text{total revenues}}$

For Amherst:

$$\text{Net profit margin} = \frac{\$10,000,000}{\$150,000,000} = 6.7\%$$

e.  $\text{Dividend payout ratio} = \frac{\text{Dividends per share}}{\text{EPS}}$

For Amherst:

$$\text{Dividend payout ratio} = \frac{\$1}{\$4} = 25\%$$

$$\text{Dividend yield} = \frac{\text{dividends per share}}{\text{market price of common stock}}$$

For Amherst:

$$\text{Dividend yield} = \frac{\$1.00}{\$20.00} = 5\%$$

f.  $\text{PEG Ratio} = \frac{\text{Stocks P/E Ratio}}{\text{3-5 years growth rate in earnings}} = 5 / 7.5 = 0.667$



P7.3 a.  $\text{Total asset turnover} = \frac{\text{Annual sales}}{\text{Total assets}}$

For Highgate Computer:

$$\text{Total asset turnover} = \frac{\$28,000,000}{\$15,000,000} = 1.87 \text{ times}$$

$$\text{Net profit margin} = \frac{\text{Net profits after taxes}}{\text{Annual sales}}$$

For Highgate Computer:

$$\text{Net profit margin} = \frac{\$2,000,000}{\$28,000,000} = 7.14\%$$

b.  $\text{Return on assets (ROA)} = \frac{\text{Net profits after taxes}}{\text{Total assets}}$

For Highgate Computer:

$$\text{ROA} = \frac{\$2,000,000}{\$15,000,000} = 13.33\%$$

*Note:* The instructor might want to show that ROA can also be found by multiplying the firm's total asset turnover by its net profit margin. This approach can be used to demonstrate that ROA is a function of a company's profitability and its asset productivity. In the case of Highgate Computer, we have:

$$\begin{aligned} \text{ROA} &= \text{Total asset turnover} \times \text{Net profit margin} \\ &= 1.87 \times .0714 = 13.3\% \end{aligned}$$

$$\text{Return on Equity (ROE)} = \frac{\text{Net profits after taxes}}{\text{Stockholder's equity}}$$

For Highgate Computer:

$$\text{ROE} = \frac{\$2,000,000}{\$6,000,000} = 33.33\%$$

$$\text{Book value per share} = \frac{\text{Stockholders' equity}}{\text{\# of shares of common stock outstanding}}$$

For Highgate Computer:

$$\text{Book value per share} = \frac{\$6,000,000}{500,000} = \$12 \text{ per share}$$



P7.4 a. (i)  $\text{EPS} = \frac{\text{Net profits after taxes} - \text{Preferred dividends}}{\text{number of common shares outstanding}}$

For Financial Learning Systems:

$$\text{EPS} = \frac{\$6,850,000 - \$500,000}{2,500,000} = \$2.54$$

(ii)  $\text{Price/Earning (P/E) ratio} = \frac{\text{Market price of stock}}{\text{EPS}}$

For Financial Learning Systems:

$$\text{P/E} = \frac{\$45.00}{\$2.54} = 17.72$$

(iii)  $\text{Book value per share} = \frac{\text{Stockholders' equity}}{\text{number of common shares outstanding}}$

For Financial Learning Systems:

$$\text{book value per share} = \frac{\$78,000,000 - \$32,000,000 - \$5m}{2,500,000}$$

$$= \$16.40 \text{ per share}$$

b. If the EPS rises to \$3.75:

$$17.72 = \frac{\text{market price of stock}}{\text{EPS}}$$

\$3.75

Market price of stock = \$66.45

If the EPS drops to \$1.50:

$$17.72 = \frac{\text{market price of stock}}{\$1.50}$$

Market price of stock = \$26.58

c. If the EPS rises to \$3.75 and P/E jumps to 25:

$$25 = \frac{\text{market price of stock}}{\$3.75}$$

Market price of stock = \$93.75

d. Both the EPS and P/E drop — to \$1.50 and 10 times earnings:

$$10 = \frac{\text{market price of stock}}{\$1.50}$$

Market price of stock = \$15.00

e. As shown in the case of Financial Learning Systems, higher earnings improve the stock price for a given P/E multiple, and when the P/E multiple rises, for a given level of earnings, the stock price rises.



P7.5 We will use the following three ratios:

Return on assets = Net profit after taxes/Total assets  
 Net profit margin = Net profit after taxes/Sales  
 Total asset turnover = Sales/Total assets

a. In this problem, we cannot calculate ROA until we find out what profits are. To do this, we must determine sales and then apply the net profit margin to this sales figure to determine net profits. That is, using the total asset turnover ratio, sales must be \$20,000,000:

$$2.0 = \text{Sales}/\$10 \text{ million}$$

$$\text{Solving for sales: Sales} = \$10 \text{ million} \times 2.0 = \$20 \text{ million}$$

Using the equation for net profit margin, net profits after taxes must be \$3,000,000:

$$0.15 = \text{net profits after taxes}/\$20 \text{ million}$$

Solving for net profits: Net profits = \$20 million  $\times$  0.15 = \$3 million

Given this information, we can compute ROA as:

$$\$3,000,000/\$10,000,000 = 30\%$$

(*Note:* Or this problem can also be solved by simply multiplying the company's asset turnover by its profit margin; i.e.,  $2.0 \times .15 = 30\%$ ).

- b. To solve this part of the problem, first find the firm's equity. We know it has \$10 million in assets and the problem states that 40% of the assets are financed with equity. Therefore:

$$\text{Equity} = \$10,000,000 \times .40 = \$4,000,000$$

Now, to find ROE:

$$\text{ROE} = \frac{\text{Net Profits}}{\text{Equity}} = \frac{\$3,000,000}{\$4,000,000} = 75\%$$

(*Note:* Comparing ROE to ROA, we see that ROE is much larger [75% vs. 30%]. The reason is the firm's high debt/financial leverage – i.e., 60% of the firm's assets are financed with debt, which acts to magnify profitability.)



$$\text{P7.6 Price/Earnings (P/E) ratio} = \frac{\text{Market price of the stock}}{\text{EPS}}$$

First, find EPS:

$$\text{EPS} = \frac{\text{Net profit after taxes}}{\text{Number of shares of stock outstanding}}$$

Since: Net profit after taxes = Sales  $\times$  net profit margin:

$$\text{EPS} = \frac{\$150,000,000 \times .10}{5,000,000} = \frac{\$15,000,000}{5,000,000} = \$3 \text{ per share}$$

$$\text{P/E ratio} = \frac{\$25}{\$3} = 8.3 \text{ times}$$

$$\text{Price-to-sales ratio} = \frac{\text{Market price of stock}}{\text{Sales per share}}$$

Find sales per share:

$$\text{SPS} = \frac{\text{Sales}}{\text{Number of shares outstanding}} = \frac{\$150,000,000}{5,000,000}$$

$$= \$30 \text{ per share}$$

Now, the Price-Sales Ratio is:

$$\text{PSR} = \frac{\$25}{\$30} = .833$$

$$\begin{aligned} \text{Dividend Yield} &= \frac{\text{Dividends per share}}{\text{Market price of common}} = \frac{\text{EPS} \times \text{Dividend payout ratio}^*}{\text{Market price of common}} \\ &= \frac{\$3 \times .35}{\$25} = \frac{\$1.05}{\$25} = 4.2\% \end{aligned}$$

\*Note: Dividends per share = EPS × Dividend payout ratio.

$$\text{PEG Ratio} = \frac{\text{Stock's P/E Ratio}}{\text{3-5 years growth rate in earnings}}$$

$$\begin{aligned} \text{This implies :} \quad \text{Growth} &= \frac{\text{Stocks P/E Ratio}}{\text{PEG Ratio}} \\ \text{Growth} &= 8.3 / 2 = 4.15\% \end{aligned}$$



- P7.7 There is no set solution to this problem, since the answer will vary with the stock selected by the student. The students should be encouraged (or required) to actually *compute* the requested ratios from the recent financial statements of the companies they select. They can use annual reports, *Moody's*, or *S&P* to obtain needed balance sheet and income statement information.

This problem may result in some interesting and possibly confusing responses, because students will get their information from many diverse sources. Frequently the ratio calculations will differ. This presents the instructor with the opportunity to discuss refinements to ratio calculations, the importance of consistency, and the fact that the ratios are only tools to be used in the stock evaluation and selection process.



- P7.8 There is no set solution to this problem. In developing an answer, the students can either “pick up” the ratios/information from *Value Line* or a similar source, or they can be required to actually compute requested ratios from the recent financial statements of the companies they select. Annual reports, *Moody's* or *S&P* will provide the needed balance sheet and income statement information.

This problem provides hands-on experience in analyzing financial information for investment purposes. The following is one way to approach the problem. The

various ratios/performance measures were collected from 1992 *Value Line* reports and the May 1992 *S&P Stock Reports*.

a. Wal-Mart vs. KMart:	<u>Wal-Mart</u>	<u>KMart</u>
Beta ( <i>Value Line</i> )	1.25	1.20
Net profit margin	3.7%	2.5%
EPS - 1991	\$1.40	\$2.02
P/E Ratio	33.7	11.2
Payout Ratio – 1991	12.0%	45.0%
Average annual dividend yield	0.4%	4.1%
Size (Sales/Revenues in \$ millions)	\$43,887	\$34,580
5-year growth in earnings	31.0%	8.0%
Return on investment – 1991	23.0%	12.5%
<i>Value Line</i> quality ratings:		
Timeliness	2	4
Safety	2	2
Financial strength	A+	A
<i>S&amp;P</i> ranking	A+	A-

Even though KMart has a higher EPS, Wal-Mart seems to have a lot of growth opportunities, as reflected by its high P/E ratio and low payout ratio. Wal-Mart has a higher net profit margin and has shown a handsome earnings growth in the last five years. Wal-Mart has a higher return on investment and gets an above-average rating on timeliness and safety. Both *Value Line* and *S&P* have given the company an A+ for its financial strength. Thus, Wal-Mart seems to be a much stronger company.

b. Sara Lee vs. Campbell Soup:	<u>Sara Lee</u>	<u>Campbell Soup</u>
Beta ( <i>Value Line</i> )	0.90	1.00
Net profit margin	7.1%	6.5%
EPS – 1991	\$1.16	\$1.58
P/E Ratio	24.0	18.5
Payout Ratio – 1991	32.0%	35.0%
Average annual dividend yield	1.2%	1.7%
Size (Sales/Revenues in \$ millions)	\$483.5	\$6,204.1
5-year growth in earnings	14.5%	3.5%
Return on investment – 1991	16.1%	22.4%
<i>Value Line</i> quality ratings:		
Timeliness	3	2

Safety	2	2
Financial strength	A	A+
S&P ranking	A	B+

Campbell Soup is a giant compared to Sara Lee, as reflected by over \$6 billion in sales revenue. But both companies seem very comparable in terms of EPS and payout ratio. Campbell does slightly better on profitability, with a return on invested capital of 22.4%. But Sara Lee earnings seem to be growing at a much higher rate, 14.5% per year. Campbell gets a better rating on timeliness and financial strength, although the growth potential displayed by Sara Lee should not be ignored.

c. IBM vs. Intel:	<u>IBM</u>	<u>Intel</u>
Beta ( <i>Value Line</i> )	0.95	1.50
Net profit margin	3.3%	16.6%
EPS – 1991	\$3.69	\$3.81
P/E Ratio	13.8	13.9
Payout Ratio– 1991	131.0%	0.0%
Average annual dividend yield	4.6%	0.0%
Size (Sales/Revenues in \$ millions)	\$64,792	\$4,778.6
5-year growth in earnings	3.0%	20.0%
Return on investment – 1991	5.7%	18.0%
<i>Value Line</i> quality ratings:		
Timeliness	3 3	
Safety	1 3	
Financial strength	A++A+	
S&P ranking	A-B-	

Intel is an up and coming computer firm. Naturally, it is a riskier stock, as revealed by a high beta and just an average safety ranking. IBM, a very established firm, gets the highest safety ranking. Intel's 18% return is much higher than IBM's, and its earnings have been growing at over 20% annually for the last 10 years. But IBM has the highest possible *Value Line* ranking for financial strength; it appears to be a fundamentally stronger firm.

d. Tupperware vs. Crown Cork & Seal:	<u>Tupperware</u>	<u>Crown Cork &amp; Seal</u>
Beta ( <i>Value Line</i> )	0.95	0.95
Net profit margin	11.8%	3.4%
EPS – 1991	\$1.49	\$1.48
P/E Ratio	22.9	18.3

Payout Ratio – 1991	57.0%	0.0%
Average annual dividend yield	2.7%	0.0%
Size (Sales/Revenues in \$ millions)	\$1,370.7	\$3,807.4
5-year growth in earnings	15.5%	13.5%
Return on investment – 1991	26.4%	11.8%
<i>Value Line</i> quality ratings:		
Timeliness	2	1
Safety	2	2
Financial strength	B++	A
<i>S&amp;P</i> ranking	A+	B+

Although Crown Cork & Seal is a bigger firm, as measured by annual sales, both companies are of comparable market risk. Tupperware seems to be much more profitable, with higher net profit margin, earnings growth, and return on investment. Tupperware pays out 57% of its earnings, while Crown is a zero dividend firm. *Value Line* and *S&P* seem to have differing opinions on these companies' financial strength. Both firms seem to display comparable fundamentals, although Tupperware is a more profitable firm.

e. Liz Claiborne vs. Hatmarx	<u>Liz Claiborne</u>	<u>Hatmarx</u>
Beta ( <i>Value Line</i> )	1.27	1.14
Net profit margin	1.4%	N.M.
EPS – 1991	\$0.30	– \$1.40
P/E Ratio	20.8	N.M.
Payout Ratio – 1991	190.0%	0.0%
Average annual dividend yield	2.6%	0.0%
Size (Sales/Revenues in \$ millions)	\$3,209	\$294
5-year growth in earnings	– 6.7%	N.M.
Return on investment – 1991	2.5%	N.M.
<i>Value Line</i> quality ratings:		
Timeliness	3	N/A
Safety	3	N/A
Financial strength	B++	N/A
S&P ranking	B+	D

Liz Claiborne is in the home furnishing business, while Hatmarx sells home decorating products. Both companies are going through a lean period, although Liz Claiborne seems to have withstood the tough times better; analysts predict a performance rebound. Hatmarx has filed a petition for reorganization under Chapter 11, so *Value Line* has stopped following the firm due to its poor performance. The firm had a \$1.40 per share *deficit* for 1991, compared to \$0.30 EPS for Liz Claiborne. Liz Claiborne is a much larger company and gets average ratings on timeliness and safety. With a B+ to B++ rating for financial strength, Liz Claiborne is obviously a stronger company than Hatmarx.

f. General Dynamics vs. Boeing	<u>General Dynamics</u>	<u>Boeing</u>
Beta ( <i>Value Line</i> )	0.85	1.25
Net profit margin	2.7%	2.1%
EPS - 1991	\$5.58	\$0.90
P/E Ratio	11.2	18.8
Payout Ratio - 1991	11.0%	133.3%
Average annual dividend yield	2.5%	4.6%
Size (Sales/Revenues in \$ millions)	\$8,751	\$8,702
5-year growth in earnings	N.M.	10.5%
Return on investment — 1991	11.8%	5.2%
<i>Value Line</i> quality ratings:		
Timeliness	—	3
Safety	3	3

Financial strength  
S&P ranking

B+  
B

B++  
B+

General Dynamics is a defense contractor, while Boeing is in the aviation business. Both firms are of a comparable size, although Boeing has a greater market risk, with a beta of 1.25. General Dynamics has a higher EPS and return on investment, but Boeing pays out more in dividends. At the time this book was written, *Value Line* suspended its timeliness rank on General Dynamics because there was outstanding stock repurchase tender offer. Analysts were not enthusiastic about the long-term fundamentals of General Dynamics, owing to the shrinking defense budget. With higher ratings for financial strength, Boeing seemed to be a safer investment.



- P7.9 a. All of the following ratios for Otago Bay Marine are based on the 2000 and 2001 financial statements (\$ in thousands) and are computed using the formulas in the chapter:

(1) Current ratio	=	Current assets / Current liabilities		
2000		\$133,212 / \$22,498	=	5.92
2001		\$111,914 / \$50,862	=	2.20
Industry			=	2.36
(2) Total asset turnover	=	Sales / Total assets		
2000		\$245,424 / \$224,470	=	1.09
2001		\$259,593 / \$303,940	=	0.85
Industry			=	1.27
(3) Debt-equity ratio	=	Long-term debt / Stockholders' equity		
2000		\$20,268 / \$181,704	=	11.15%
2001		\$40,735 / \$212,343	=	19.18%
Industry			=	10.0 %
(4) Net profit margin	=	Net profit after taxes / Total Revenues		
2000		\$32,032 / \$245,424	=	13.05%
2001		\$35,442 / \$259,593	=	13.65%
Industry			=	9.30%

(5) ROA	=	Net profit after taxes / Total assets	
2000		\$32,032 / \$224,470	= 14.27%
2001		\$35,442 / \$303,940	= 11.66%
Industry			= 15.87%

(6) ROE	=	Net profit after taxes / Stockholders' Equity	
2000		\$32,032 / \$181,704	= 17.63%
2001		\$35,442 / \$212,343	= 16.69%
Industry			= 19.21%

(7) EPS	=	$\frac{\text{Net profit after taxes} - \text{Preferred dividends}}{\text{Number of common shares outstanding}}$	
2000		$\frac{\$32,032 - \$0}{10,848}$	= \$2.95 per share
2001		$\frac{\$35,442 - \$0}{10,848}$	= \$3.27 per share
Industry			= \$1.59

(8) P/E Ratio	=	share price / EPS	
2000		\$80.75 / \$2.95	= 27.37
2001		\$74.25 / \$3.27	= 22.71
Industry			= 19.87

(9) Dividend yield	=	Dividends per share / Market price per share	
2000		\$ .27 / \$80.75	= 0.33%
2001		\$ .35 / \$74.25	= 0.47%
Industry			= 0.44%

(10) Dividend payout ratio	=	Dividends per share / EPS	
2000		\$ .27 / \$2.95	= 9.15%
2001		\$ .35 / \$3.27	= 10.70%
Industry			= 26.00%

(11) Price-to-book value ratio	=	Share price / Book value per share	
--------------------------------	---	------------------------------------	--

Book value per share	=	$\frac{\text{stockholder's equity}}{\text{number of common shares outstanding}}$
----------------------	---	--

$$2000 \text{ BV} = \frac{\$181,704}{10,848} = \$16.75$$

$$2001 \text{ BV} = \frac{\$212,343}{10,848} = \$19.57$$

Price-to-book-value:

$$2000 = \$80.75 / \$16.75 = 4.82$$

$$2001 = \$74.25 / \$19.57 = 3.79$$

$$\text{Industry} = 6.65$$

- b. Based on the comparison to industry average ratios, the financial condition of Otago Bay Marine (OBM) appears to be deteriorating. First, OBM's current ratio has declined 65%, indicating its ability to meet short-term obligations has weakened substantially. OBM's current liabilities, which have grown 126% over the past year, are driving this weakened position in liquidity.

Also, the activity measure—total asset turnover—which was below the industry average last year, has declined even further, suggesting that corporate resources are being poorly managed. With respect to leverage, OBM's ratio has grown to nearly twice the industry average, indicating a need to control and reduce the amount of debt in the capital structure. Despite the high leverage ratio, the firm's ROE, which indicates the extent to which leverage has enhanced the returns to stockholders, has declined even further below the industry's average. Similarly, OBM's ROA has declined even further below the industry's average ROA.

The market appears to reflect this deterioration in OBM's financial picture from 2000 to 2001. The stock price has declined 8% and the P/E ratio has declined 17%, and the price-to-book value has decline another 1% to about half of the industry average.

In summary, despite the relatively small percentage increases in net profit after taxes, Otago Bay Marine seems poorly managed. Gone unchecked, OBM's financial condition will deteriorate further and be reflected in profitability measures well below industry averages. Although OBM's ratios are only one part of their total financial outlook, they seem to indicate that problems exist within the firm.



P7.10 a. FOR 1997

$$\begin{aligned} \text{Profit margin} &= \frac{\text{net earnings}}{\text{net sales}} \\ &= \frac{\$ 20.2}{\$179.3} \\ &= 11.27\% \\ \text{Asset turnover} &= \frac{\text{net sales}}{\text{total assets}} \\ &= \frac{\$ 179.3}{\$136.3} \\ &= 1.32 \end{aligned}$$

Using profit margin and asset turnover to calculate ROA:

$$\text{ROA} = \frac{\text{net earnings}}{\text{net sales}} \times \frac{\text{net sales}}{\text{total assets}}$$

$$\begin{aligned} \text{ROA} &= 11.27\% \times 1.32 \\ &= 14.88\% \end{aligned}$$

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier}$$

$$\begin{aligned} \text{Where Equity multiplier} &= \frac{\text{Total assets}}{\text{stockholder's equity}} \\ &= \frac{\$136.3}{\$109.6} \\ &= 1.24 \end{aligned}$$

$$\begin{aligned} \text{ROE} &= 14.88\% \times 1.24 \\ &= 18.45\% \end{aligned}$$

b. For 2001:

$$\begin{aligned} \text{ROA} &= \text{Profit margin} \times \text{Total asset turnover} \\ &= 13.65\% \times 0.85 \\ &= 11.60\% \end{aligned}$$

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Equity multiplier} \\ &= 11.60\% \times (\$303,940 / \$212,343) \\ &= 11.60\% \times 1.43 \\ &= 16.59\% \end{aligned}$$

- c. Between 2000 and 2001, Otago Bay Marine's ROA and ROE measures both deteriorated. With respect to ROA, total assets have grown faster than net sales, thereby affecting total asset turnover—and consequently, ROA—adversely: Whereas net sales grew 44%, total assets grew 123%. The second component of ROA, the profit margin, grew slightly. Thus, the decline in ROA is attributable mainly to the dramatic increase in total assets (ROA fell from 14.88% in 2000 to 11.6 % in 2001).

The growth in total assets is also a main contributor to the decline in ROE, which is composed of ROA, multiplied by the equity multiplier. The higher equity multiplier reflects the fact that total assets also outgrew stockholder's equity (a large portion of new assets were debt-financed). However, the multiplier was not large enough to reverse the effects of the decline in ROA on ROE. Thus, through the sharp increase in total assets, ROA and ROE declined.

- d. Generally, these changes from 2000 to 2001 do not appear fundamentally healthy for Otago Bay Marine. The higher total assets, a large percentage of which was financed by debt, appears to have reduced OBM's profitability and its future ability to meet short and long-term obligations.

ents and notes about the report with the class.