Solved Problems

14.1 Smith Corporation provides the following comparative income statement:

Smith Corporation
Comparative Income Statement
For the Years Ended December 31, 20X3 and 20X2

	20X3	20X2	Percentage of Increase or (Decrease)
Sales	$570,000	$680,000	
Cost of Goods Sold	200,000	170,000	
Gross Profit	$370,000	$510,000	
Operating Expenses	100,000	210,000	
Net Income	$270,000	$300,000	

(*a*) Using horizontal analysis, fill in the percentage change.

(*b*) Evaluate the results.

SOLUTION

(*a*)

Smith Corporation
Comparative Income Statement
For the Years Ended December 31, 20X3 and 20X2

	20X3	20X2	Percentage of Increase or (Decrease)
Sales	$570,000	$680,000	(16.2)
Cost of Goods Sold	200,000	170,000	(17.6)
Gross Profit	$370,000	$510,000	(27.5)
Operating Expenses	100,000	210,000	(52.4)
Net Income	$270,000	$300,000	(10.0)

(*b*) Gross profit declined 27.5 percent due to the combined effects of lower sales and higher cost of sales. However, operating expenses were sharply cut. This kept the decline in net income to only 10 percent.

14.2 Jones Corporation reports the following for the period 20X1–20X3:

	20X3	20X2	20X1
Current Liabilities	$34,000	$25,000	$20,000
Long-term Liabilities	60,000	45,000	50,000

The base year is 20X1. Using trend analysis, determine the appropriate index numbers.

SOLUTION

	20X3	20X2	20X1
Current Liabilities	170	125	100
Long-term Liabilities	120	90	100

14.3 The Lyons Corporation reported the following income statement data:

	20X2	20X1
Net Sales	$400,000	$250,000
Cost of Goods Sold	280,000	160,000
Operating Expenses	75,000	56,000

(*a*) Prepare a comparative income statement for 20X2 and 20X1 by using vertical analysis.

(*b*) Evaluate the results.

SOLUTION

(*a*)

The Lyons Corporation
Income Statement and
Common Size Analysis
For the Years Ended December 31, 20X2 and 20X1

	20X2		20X1	
	Amount	Percent	Amount	Percent
Net Sales	$400,000	100.0	$250,000	100.0
Cost of Goods Sold	280,000	70.0	160,000	64.0
Gross Profit	$120,000	30.0	$ 90,000	36.0
Operating Expenses	75,000	18.8	56,000	22.4
Net Income	$ 45,000	11.3	$ 34,000	13.6

(*b*) Cost of goods sold has risen, possibly due to the higher cost of buying merchandise. Operating expenses have dropped, possibly due to better cost control. Overall, there has been a decline in profitability.

14.4 Charles Corporation's balance sheet at December 31, 20X7, shows the following:

Current Assets	
Cash	$ 4,000
Marketable Securities	8,000
Accounts Receivable	100,000
Inventories	120,000
Prepaid Expenses	1,000
Total Current Assets	$233,000
Current Liabilities	
Notes Payable	$ 5,000
Accounts Payable	150,000
Accrued Expenses	20,000
Income Taxes Payable	1,000
Total Current Liabilities	$176,000
Long-term Liabilities	$340,000

Determine (*a*) working capital, (*b*) current ratio, and (*c*) quick ratio.

SOLUTION

(*a*) Current assets − Current liabilities = Working capital
$\$233{,}000 - \$176{,}000 = \$57{,}000$

(*b*) $$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$233{,}000}{\$176{,}000} = 1.32$$

(*c*) $$\text{Quick ratio} = \frac{\text{Cash + Marketable securities + Accounts receivable}}{\text{Current liabilities}} = \frac{\$4{,}000 + \$8{,}000 + \$100{,}000}{\$176{,}000}$$

$$= \frac{\$112{,}000}{\$176{,}000} = 0.64$$

14.5 Based upon the answers to Problem 14.4, does Charles Corporation have good or poor liquidity if the industry averages are a current ratio of 1.29 and a quick ratio of 1.07?

SOLUTION

While the company's current ratio is slightly better than the industry norm, its quick ratio is significantly below the norm. Charles Corporation has more in current liabilities than in highly liquid assets. It therefore has a poor liquidity position.

14.6 The Rivers Company reports the following data relative to accounts receivable:

	20X2	20X1
Average Accounts Receivable	$ 400,000	$ 416,000
Net Credit Sales	2,600,000	3,100,000

The terms of sale are net 30 days. (*a*) Compute the accounts receivable turnover and the collection period. (*b*) Evaluate the results.

SOLUTION

(*a*) $$\text{Accounts receivable turnover} = \frac{\text{Net credit sales}}{\text{Average accounts receivable}}$$

$$\text{20X2: } \frac{\$2{,}600{,}000}{\$400{,}000} = 6.5 \text{ times; 20X1: } \frac{\$3{,}100{,}000}{\$416{,}000} = 7.45 \text{ times}$$

$$\text{Collection period} = \frac{365 \text{ days}}{\text{Accounts receivable turnover}}$$

$$\text{20X2: } \frac{365}{6.5} = 56.2 \text{ days; 20X1: } \frac{365}{7.45} = 49 \text{ days}$$

(*b*) The company's management of accounts receivable is poor. In both years, the collection period exceeded the terms of net 30 days. The situation is getting worse, as is indicated by the significant increase in the collection period in 20X2 relative to 20X1. The company has significant funds tied up in accounts receivable that could be invested for a return. A careful evaluation of the credit policy is needed. Perhaps sales are being made to marginal customers.

14.7 Utica Company's net accounts receivable were $250,000 at December 31, 20X8, and $300,000 at December 31, 20X9. Net cash sales for 20X9 were $100,000. The accounts receivable turnover for 20X9 was 5.0. What were Utica's total net sales for 20X9? (AICPA Adapted)

SOLUTION

$$\text{Average accounts receivable} = \frac{\text{Beginning accounts receivable} + \text{Ending accounts receivable}}{2}$$

$$= \frac{\$250{,}000 + \$300{,}000}{2} = \$275{,}000$$

$$\text{Accounts receivable turnover} = \frac{\text{Net credit sales}}{\text{Average accounts receivable}}$$

$$5 = \frac{\text{Net credit sales}}{\$275{,}000}$$

$$\text{Net credit sales} = 5 \times \$275{,}000 = \$1{,}375{,}000$$

Since the cash sales were $100,000, the total net sales must be $1,475,000.

14.8 On January 1, 20X6, the River Company's beginning inventory was $400,000. During 20X6, River purchased $1,900,000 of additional inventory. On December 31, 20X6, River's ending inventory was $500,000.

(*a*) What is the inventory turnover and the age of inventory for 20X6?

(*b*) If the inventory turnover in 20X5 was 3.3 and the age of the inventory was 110.6 days, evaluate the results for 20X6.

SOLUTION

(*a*)

Cost of Goods Sold	
Beginning Inventory	$ 400,000
Purchases	1,900,000
Cost of Goods Available	$2,300,000
Ending Inventory	500,000
Cost of Goods Sold	$1,800,000

$$\text{Average Inventory} = \frac{\text{Beginning inventory} + \text{Ending inventory}}{2}$$

$$= \frac{\$400{,}000 + \$500{,}000}{2} = \$450{,}000$$

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{\$1{,}800{,}000}{\$450{,}000} = 4$$

$$\text{Age of inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}} = \frac{365}{4} = 91.3 \text{ days}$$

(*b*) River Company's inventory management improved in 20X6, as evidenced by the higher turnover rate and decrease in the days that inventories were held. As a result, there is less liquidity risk. Further, the company's profitability will benefit by the increased turnover of merchandise.

14.9 Based on your answer to Problem 14.8, what is the operating cycle in 20X6 if we assume that the collection period is 42 days?

SOLUTION

Number of days inventory is held	91.3
Number of days receivables are held	42.0
Operating cycle	133.3 days

14.10 A condensed balance sheet and other financial data for Alpha Company appear below.

Alpha Company
Balance Sheet
December 31, 20X1

ASSETS	
Current Assets	$100,000
Plant Assets	150,000
Total Assets	$250,000

LIABILITIES AND STOCKHOLDERS' EQUITY

Current Liabilities	$100,000
Long-term Liabilities	75,000
Total Liabilities	$175,000
Stockholders' Equity	75,000
Total Liabilities and Stockholders' Equity	$250,000

Income Statement Data

Net Sales	$375,000
Interest Expense	4,000
Net Income	22,500

The following account balances existed at December 31, 20X0: Total assets, $200,000; Stockholders' Equity, $65,000. The tax rate is 35 percent.

Industry Norms as of December 31, 20X1

Stockholders' equity to total liabilities	0.57
Stockholders' equity to long-term liabilities	1.15
Plant assets to long-term liabilities	2.40
Profit margin	0.12
Return on total assets	0.15
Return on stockholders' equity	0.30
Net sales to average total assets	1.71

Calculate and evaluate the following ratios for Alpha Company as of December 31, 20X1.

(*a*) Stockholders' equity to total liabilities
(*b*) Stockholders' equity to long-term liabilities
(*c*) Plant assets to long-term liabilities
(*d*) Profit margin
(*e*) Return on total assets
(*f*) Return on stockholders' equity
(*g*) Net sales to average total assets

SOLUTION

(*a*) $$\frac{\text{Stockholders' equity}}{\text{Total liabilities}} = \frac{\$75{,}000}{\$175{,}000} = 0.43$$

Alpha's percentage of stockholders' equity to total liabilities is considerably below the industry norm, indicating a solvency problem. Excessive debt may make it difficult for the firm to meet its obligations during a downturn in business. A high debt position will also make it difficult for the entity to obtain financing during a period of tight money supply.

(*b*) $$\frac{\text{Stockholders' equity}}{\text{Long-term liabilities}} = \frac{\$75{,}000}{\$75{,}000} = 1$$

The company's ratio is again below the industry norm, which means it is less solvent than other companies in the industry.

(*c*) $$\frac{\text{Plant assets}}{\text{Long-term liabilities}} = \frac{\$150{,}000}{\$75{,}000} = 2$$

Because Alpha's ratio is lower than the industry norm, we can infer that long-term creditors have a greater than normal claim on the firm's plant assets. Alpha's long-term borrowing capacity is therefore more limited than that of its competition.

(*d*) $$\text{Profit margin} = \frac{\text{Net income}}{\text{Net sales}} = \frac{\$22{,}500}{\$375{,}000} = 0.06$$

Alpha's profit margin is far below the industry norm. This indicates that the operating performance of the entity is poor because the profitability generated from revenue sources is low.

(*e*) $$\text{Return on total assets} = \frac{\text{Net income} + \text{Interest expense (net of tax)}}{\text{Average total assets}}$$

$$= \frac{\$22{,}500 + \$4{,}000(1 - 0.35)}{(\$200{,}000 + \$250{,}000)/2}$$

$$= \frac{\$\ 25{,}100}{\$225{,}000} = 0.11$$

Alpha's ratio is below the industry norm. Therefore, the company's efficiency in generating profit from assets is low. Profit generation is, of course, different from revenue (sales) generation because for the former, corporate expenses are deducted from sales.

(*f*) $$\text{Return on stockholders' equity} = \frac{\text{Net income}}{\text{Average stockholders' equity}}$$

$$= \frac{\$22{,}500}{(\$65{,}000 + \$75{,}000)/2}$$

$$= \frac{\$22{,}500}{\$70{,}000} = 0.32$$

Since the return earned by Alpha's stockholders is slightly more than the industry norm, investment in the firm relative to competition was advantageous to existing stockholders. This may be due to a currently low stockholders' equity investment in the firm.

(*g*) $$\frac{\text{Net sales}}{\text{Average total assets}} = \frac{\$375{,}000}{\$225{,}000} = 1.67$$

Alpha's ratio is about the same as the industry norm. Therefore, the company's ability to utilize its assets in obtaining revenue is similar to the competition's. The utilization of assets has a bearing upon the ultimate profitability to stockholders.

14.11 The Format Company reports the following balance sheet data:

Current Liabilities	$280,000
Bonds Payable, 16%	120,000
Preferred Stock, 14%, $100 par value	200,000
Common Stock, $25 par value, 16,800 shares	420,000
Premium on Common Stock	240,000
Retained Earnings	180,000

Income before taxes is $160,000. The tax rate is 40 percent. Common stockholders' equity in the previous year was $800,000. The market price per share of common stock is $35. Calculate (*a*) net income, (*b*) preferred dividends, (*c*) return on common stock, (*d*) interest coverage, (*e*) earnings per share, and (*f*) price/earnings ratio.

SOLUTION

(*a*)

Income before taxes	$160,000
Taxes (40% rate)	64,000
Net income	$ 96,000

(*b*) $14\% \times \$200{,}000 = \$28{,}000$

(*c*) Common stockholders' equity:

Common Stock	$420,000
Premium on Common Stock	240,000
Retained Earnings	180,000
Common Stockholders' Equity	$840,000

$$\text{Return on common stock} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common stockholders' equity}}$$

$$= \frac{\$96{,}000 - \$28{,}000}{(\$800{,}000 + \$840{,}000)/2} = \frac{\$68{,}000}{\$820{,}000} = 0.08$$

(*d*) Income before interest and taxes equals:

Income before taxes	$160,000
Interest expense (16% × $120,000)	19,200
Income before interest and taxes	$179,200

$$\text{Interest coverage} = \frac{\text{Income before interest and taxes}}{\text{Interest expense}} = \frac{\$179{,}200}{\$19{,}200} = 9.33 \text{ times}$$

(*e*) $$\text{Earnings per share} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Common stock outstanding}} = \frac{\$96{,}000 - \$28{,}000}{16{,}800 \text{ shares}} = \$4.05$$

(*f*) $$\text{Price/earnings ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}} = \frac{\$35.00}{\$4.05} = 8.64 \text{ times}$$

14.12 Wilder Corporation's common stock account for 20X3 and 20X2 showed $45,000 of common stock at $10 par value. Additional data are

	20X3	20X2
Dividends	$2,250.00	$3,600.00
Market Price Per Share	20.00	22.00
Earnings Per Share	2.13	2.67

(*a*) Calculate the dividends per share, dividend yield, and dividend payout.

(*b*) Evaluate the results.

SOLUTION

(*a*) $$\text{Dividends per share} = \frac{\text{Dividends}}{\text{Outstanding shares}}$$

$$20X3: \frac{\$2,250}{4,500 \text{ shares}} = \$0.50; \quad 20X2: \frac{\$3,600}{4,500 \text{ shares}} = \$0.80$$

$$\text{Dividend yield} = \frac{\text{Dividends per share}}{\text{Market price per share}}$$

$$20X3: \frac{\$0.50}{\$20.00} = 0.03; \quad 20X2: \frac{\$0.80}{\$22.00} = 0.04$$

$$\text{Dividend payout} = \frac{\text{Dividends per share}}{\text{Earnings per share}}$$

$$20X3: \frac{\$0.50}{\$2.13} = 0.23; \quad 20X2: \frac{\$0.80}{\$2.67} = 0.30$$

(*b*) The decline in dividends per share, dividend yield, and dividend payout from 20X2 to 20X3 will cause concern to stockholders.

14.13 Jones Corporation's financial statements appear below.

Jones Corporation
Balance Sheet
December 31, 20X1

ASSETS		
Current Assets		
Cash	$100,000	
Marketable Securities	200,000	
Inventory	300,000	
Total Current Assets		$ 600,000
Noncurrent Assets		
Plant Assets		500,000
Total Assets		$1,100,000
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities	$200,000	
Long-term Liabilities	100,000	
Total Liabilities		$ 300,000
Stockholders' Equity		
Common Stock, $1 par value, 100,000 shares	$100,000	
Premium on Common Stock	500,000	
Retained Earnings	200,000	
Total Stockholders' Equity		800,000
Total Liabilities and Stockholders' Equity		$1,100,000

Jones Corporation
Income Statement
For the Year Ended December 31, 20X1

Net Sales	$10,000,000
Cost of Goods Sold	6,000,000
Gross Profit	$ 4,000,000
Operating Expenses	1,000,000
Income before Taxes	$ 3,000,000
Income Taxes (50% rate)	1,500,000
Net Income	$ 1,500,000

Additional information available is a market price of $150 per share of stock and total dividends of $600,000 for 20X1, and $250,000 of inventory as of December 31, 20X0. Compute the following ratios:

(*a*) Current ratio
(*b*) Quick ratio
(*c*) Inventory turnover
(*d*) Age of inventory
(*e*) Stockholders' equity to total liabilities
(*f*) Plant assets to long-term liabilities
(*g*) Operating expenses to net sales
(*h*) Earnings per share
(*i*) Price/earnings ratio
(*j*) Dividends per share
(*k*) Dividend payout

SOLUTION

(*a*) $$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$600{,}000}{\$200{,}000} = 3$$

(*b*) $$\text{Quick ratio} = \frac{\text{Cash + Marketable securities}}{\text{Current liabilities}} = \frac{\$300{,}000}{\$200{,}000} = 1.5$$

(*c*) $$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{\$6{,}000{,}000}{(\$250{,}000 + \$300{,}000)/2} = 21.82$$

(*d*) $$\text{Age of inventory} = \frac{365}{\text{Inventory turnover}} = \frac{365}{21.82} = 16.7 \text{ days}$$

(*e*) $$\frac{\text{Stockholders' equity}}{\text{Total liabilities}} = \frac{\$800{,}000}{\$300{,}000} = 2.67$$

(*f*) $$\frac{\text{Plant assets}}{\text{Long-term liabilities}} = \frac{\$500{,}000}{\$100{,}000} = 5$$

(*g*) $$\frac{\text{Operating expenses}}{\text{Net sales}} = \frac{\$1{,}000{,}000}{\$10{,}000{,}000} = 0.1$$

(*h*) $$\text{Earnings per share} = \frac{\text{Net income}}{\text{Outstanding common shares}} = \frac{\$1{,}500{,}000}{100{,}000 \text{ shares}} = \$15$$

(*i*) Price/earnings ratio $= \dfrac{\text{Market price per share}}{\text{Earnings per share}} = \dfrac{\$150}{\$15} = 10$

(*j*) Dividends per share $= \dfrac{\text{Dividends}}{\text{Outstanding shares}} = \dfrac{\$600{,}000}{100{,}000 \text{ shares}} = \$6$

(*k*) Dividend payout $= \dfrac{\text{Dividends per share}}{\text{Earnings per share}} = \dfrac{\$6}{\$15} = 0.4$