

FCS5510 Sample Homework Problems Unit04

CHAPTER 8 STOCK

PROBLEMS

1. An investor buys 100 shares of a \$40 stock that pays a annual cash dividend of \$2 a share (a 5% dividend yield) and signs up for the dividend reinvestment plan.
  - a. If neither the price of the stock nor the dividend changes, how many shares will the investor have at the end of ten years?

**The dividend yield is 5 percent ( $\$2/\$40 = 5$  percent). Given that neither the price of the stock nor the dividend changes, the number of shares in the dividend reinvestment plan will grow annually by 5 percent.**

**Total shares at the end of ten years is  $100 \times (1+5\%)^{10} = 162.9$ .**

4. The income statement and balance sheet are presented as follows. Please compute various financial ratios. Then compare these results with the industrial averages listed in the textbook on page 298. What strengths and weaknesses are apparent?

Income Statement for XYZ for the period ending December 31, 20XX	
Sales	\$90,000
Cost of goods sold	<u>54,000</u>
Gross profit	36,000
Selling and administrative expense	<u>13,500</u>
Operating profit	22,500
Interest expense	<u>4,500</u>
Earnings before taxes	18,000
Taxes	<u>2,880</u>
Earnings available to stockholders	<u>\$15,120</u>
Number of shares outstanding	9,000
Earnings per share	\$1.51
(To compute the inventory turnover, assume that the prior year's inventory was \$36,000.)	

Firm XYZ Balance Sheet as of December 31, 20XX Assets		
Current assets	--	--
Cash and marketable securities	--	\$9,000
Accounts receivable	\$28,800	--

Less allowance for doubtful accounts	<u>1,800</u>	27,000
Inventory	--	--
Finished goods	27,000	--
Work in progress	4,500	--
Raw materials	<u>6,300</u>	<u>37,800</u>
Total current assets	--	\$73,800
Investments	--	\$9,000
Long-term assets	--	--
Plant and equipment	90,000	--
Less accumulated depreciation	<u>27,000</u>	63,000
Land	--	<u>9,000</u>
Total long-term assets	--	<u>\$72,000</u>
Total assets	--	<u>\$154,800</u>

Liabilities & Stockholders' Equity	
Current liabilities	--
Accounts payable	\$9,000
Accrued wages	9,900
Bank notes	13,500
Accrued interest payable	3,600
Accrued taxes	<u>900</u>
Total current liabilities	\$36,900
Long-term debt	<u>13,500</u>
Total liabilities	\$50,400
Stockholders' equity	--
Common stock(\$1 par value; 20,000 shares authorized; 10,000 shares outstanding)	\$9,000
Additional paid-in capital	18,000
Retained earnings	<u>77,400</u>
Total stockholders' equity	<u>\$104,400</u>
Total liabilities and equity	<u>\$154,800</u>

a) **Current ratio:**

$$\frac{\text{current assets}}{\text{current liabilities}} = \frac{\$73,800}{\$36,900} = 2$$

b) **Quick ratio (acid test):**

$$\frac{\text{current assets minus inventory}}{\text{current liabilities}} = \frac{\$36,000}{\$36,900} = 0.98$$

c) Inventory turnover:  
$$\frac{\text{sales}}{\text{average inventory}} = \frac{\$90,000}{(\$37,800 + \$36,000)/2} = 2.4$$

or  
$$\frac{\text{cost of goods sold}}{\text{average inventory}} = \frac{\$54,000}{(\$37,800 + \$36,000)/2} = 1.5$$

d) Receivables turnover:  
$$\frac{\text{annual credit sales}}{\text{accounts receivable}}$$

or  
$$\frac{\text{annual sales}}{\text{accounts receivable}} = \frac{\$90,000}{\$27,000} = 3.3$$

Average collection period:

$$\frac{\text{receivables}}{\text{sales per day}} = \frac{\$27,000}{\$90,000/360} = 108 \text{ days}$$

Operating profit margin:

$$\frac{\text{earnings before interest and taxes}}{\text{sales}} = \frac{\$22,500}{\$90,000} = 25\%$$

Net profit margin:

$$\frac{\text{earnings after taxes}}{\text{sales}} = \frac{\$15,120}{\$90,000} = 16.8\%$$

Return on assets:

$$\frac{\text{earnings after taxes}}{\text{total assets}} = \frac{\$15,120}{\$154,800} = 9.8\%$$

Return on equity:

$$\frac{\text{earnings after taxes}}{\text{equity}} = \frac{\$15,120}{\$104,400} = 14.5\%$$

Return on investment:

$$\frac{\text{earnings}}{\text{sales}} \times \frac{\text{sales}}{\text{assets}} = \frac{\$15,120}{\$90,000} \times \frac{\$90,000}{\$154,800} = 9.8\%$$

Debt/net worth:

$$\frac{\text{debt}}{\text{equity}} = \frac{\$50,400}{\$104,400} = 48.3\%$$

Debt ratio:

$$\frac{\text{debt}}{\text{total assets}} = \frac{\$50,400}{\$154,800} = 32.6\%$$

Times-interest-earned:

$$\frac{\text{earnings before interest and taxes}}{\text{interest expense}} = \frac{\$22,500}{\$4,500} = 5.0$$

Strengths:

The current ratio, acid test, and inventory are comparable to the industry averages, and the operating profit margin exceeds the industry average. In general, the firm is performing acceptably.

**Weaknesses:**

There are two basic weaknesses. One is the slow collection of accounts receivable which are taking, on the average, 108 days to collect while the industry average is about 75 days. The firm is also using more debt financing than the industry (32.6 percent versus 25 percent for the industry). This increased debt financing may be financing the increased investment in accounts receivable. If the firm can collect its accounts receivable more rapidly, then it will be able to pay off some of its liabilities and thus reduce its debt ratio.

The increased usage of debt may also explain why the net profit margin is below the industry average. Since the operating profit margin is comparable to the industry, the lower net profit margin can not be explained by the firm's operations. Either interest expense or higher taxes must be the source of the lower net profit margin. If the lower net profit margin is the result of increased interest expense, then this is probably the result of carrying too many accounts receivable.

5. You have taken the following information from a firm's financial statements. As an investor in the firm's debt instruments, you are concerned with its liquidity position and its use of financial leverage. What conclusions can you draw from this information?

--	2010	2009	2008
Sales	\$1,700,000	\$1,500,000	\$1,000,000
Cash	18,000	7,000	5,000
Accounts receivable	152,000	130,000	125,000
Inventory	200,000	190,000	200,000
Current liabilities	225,000	210,000	175,000
Operating income	170,000	145,000	90,000
Interest expense	27,000	23,000	20,000
Taxes	53,000	45,000	25,000
Net income	90,000	77,000	45,000
Debt	260,000	250,000	200,000
Equity	330,000	300,000	200,000

An investor in debt instruments is primarily concerned with the firm's capacity to pay the interest and make the principal repayment. Emphasis will be placed on liquidity ratios and times-interest-earned. Emphasis may also be placed on the turnover of current assets, since such turnover generates the cash to make the creditor's payments.

Current ratio:

$$2008: \frac{\$5,000 + 125,000 + 200,000}{\$175,000} = 1.9$$

$$2009: \frac{\$7,000 + 130,000 + 190,000}{\$210,000} = 1.5$$

$$2010: \frac{\$18,000 + 152,000 + 200,000}{\$225,000} = 1.6$$

There has been a decline in the current ratio.

Quick ratio:

$$2008: \frac{\$5,000 + 125,000}{\$175,000} = 0.7$$

$$2009: \frac{\$7,000 + 130,000}{\$175,000} = 0.8$$

$$2010: \frac{\$18,000 + 152,000}{\$225,000} = 0.8$$

There has been little change in the quick ratio.

Inventory turnover (using average inventory):

$$2009: \frac{\$1,500,000}{(\$200,000 + 190,000)/2} = 7.7$$

$$2010: \frac{\$1,700,000}{(\$190,000 + 200,000)/2} = 8.7$$

Inventory turnover has increased.

Days Sales Outstanding (Average collection period):

$$2008: \frac{\$125,000}{\$1,000,000/360} = 45$$

$$2009: \frac{\$130,000}{\$1,500,000/360} = 31$$

$$2010: \frac{\$152,000}{\$1,500,000/360} = 32$$

$\$1,700,000/360$

**Days sales outstanding has dramatically improved.**

**Times-interest-earned:** 2008:  $\$90,000/\$20,000 = 4.5$   
2009:  $\$145,000/\$23,000 = 6.3$   
2010:  $\$170,000/\$27,000 = 6.3$

**Times-interest-earned has improved.**

**With the exception of the slight decline in the current ratio, there has been no change that indicates deterioration in the creditor's position. The creditor's position has probably improved.**

6. What is the debt/equity ratio for a firm with total debt of \$500,000 and equity of \$200,000?

**Debt/Net worth:  $\$500,000/\$200,000 = 2.5$**

**Debt ratio (Debt/Total assets):**

$$\$500,000/(\$500,000 + \$200,000) = 0.71 = 71\%$$

7. A firm with sales of \$800,000 has average inventory of \$400,000. The industry average for inventory turnover is four times a year. What would be the reduction in inventory if this firm were to achieve a turnover comparable to the industry average?

**The firm wants to achieve the industry average given its level of sales. Thus:**

$$\text{Industry average} = \text{Sales}/\text{Average inventory}$$

$$4 = \$800,000/X$$

$$X = \$200,000$$

**Since the firm's inventory is \$400,000, the reduction in inventory will be  $\$400,000 - \$200,000 = \$200,000$ .**

12. Company A has three debt issues of \$3,000 each. The interest rate on issue A is 4 percent, on B the rate is 6 percent, and on C the rate is 8 percent. Issue B is subordinate to A, and issue C is subordinate to both A and B. The firm's operating income (EBIT) is \$500. What is the times-interest-earned ratio for issue A and B, and C?

**Times interest earned = EBIT/Interest**

$$\text{Issue A} \quad \$500/\$120 = 4.2$$

$$\text{Issue B} \quad \$500/(\$120 + 180) = 1.7$$

$$\text{Issue C} \quad \$500/(\$120 + 180 + 240) = .9$$

These answers indicate that the firm has insufficient operating income to meet all of its interest expense. If C is subordinated to A and B (and the above calculations are made based on that assumption), the interest payment to C may not be made unless the firm has cash or other sources of funds that may be used to meet the interest payment.

8. If a firm has sales of \$36,000,000 a year, and the average collection period for the industry is 30 days, what should this firm's accounts receivable be if the firm is comparable to the industry?

$$\text{Average collection period} = \frac{\text{Accounts receivable}}{\text{Sales per day}}$$

To determine what the firm's accounts receivable should be to be comparable to the industry, solve the following equation:

$$30 = X/[(\$36,000,000/360)]$$

$$X = \$3,000,000$$

9. Two firms have sales of \$1 million each. Other financial information is as follows:

--	Firm A	Firm B
EBIT	\$150,000	\$150,000
Interest expense	20,000	75,000
Income tax	50,000	30,000
Equity	300,000	100,000

What is the operating profit margin for Firm A?

What is the net profit margin for Firm A?

What is the return on equity for Firm B?

$$\text{Operating profit margin} = \text{EBIT}/\text{Sales}$$

$$\text{Firm A: } \$150,000/\$1,000,000 = 15\%$$

$$\text{Net profit margin} = \text{Net earnings}/\text{Sales}$$

$$\text{Firm A: } \$80,000/\$1,000,000 = 8\%$$

$$\text{Return on equity} = \text{Earnings}/\text{Equity}$$

$$\text{Firm B: } \$45,000/\$100,000 = 45\%$$