Chapter 18—Financial Statement Analysis

CHAPTER OVERVIEW

Financial statements are the primary means an outsider uses to evaluate a particular company. Once completed, the results can be compared with other companies. There are a variety of tools used to evaluate performance. In this chapter you are introduced to some of these techniques. The learning objectives for the chapter are to

1. Perform a horizontal analysis of financial statements.
2. Perform a vertical analysis of financial statements.
3. Prepare and use common-size financial statements.
4. Compute the standard financial ratios.

CHAPTER REVIEW

Financial statement analysis is based on information taken from the annual report, articles in the business press, and so on. The objective of financial statement analysis is to provide information to creditors and investors to help them 1) predict expected returns and 2) assess the risk of those returns. Past performance is often a good indicator of future performance. Three categories of financial statement analysis are: horizontal, vertical, and ratio analysis.

Objective 1 - Perform a horizontal analysis of financial statements.

The study of percentage changes in comparative statements is called horizontal analysis. Horizontal analysis highlights changes over time. Computing a percentage change in comparative statements requires two steps: 1) compute the dollar amount of the change from the base period to the later period, and 2) divide the dollar amount of the change by the base period amount.

The base period for horizontal analysis is the year prior to the year being considered. Suppose there are three years of data. The change from Year 1 to Year 2 is:

$$\frac{\text{YEAR 2} - \text{YEAR 1}}{\text{YEAR 1}}$$

and the change from Year 2 to Year 3 is:

$$\frac{\text{YEAR 3} - \text{YEAR 2}}{\text{YEAR 2}}$$

No percentage changes are computed if the base-year amount is zero or negative. Exhibits 18-2 and 18-3 illustrate horizontal analysis on an income statement and balance sheet.

Trend percentages are a form of horizontal analysis. They indicate the direction of business activities by comparing numbers over a span of several years. Trend percentages are computed by selecting a base year and expressing the amount of each item for each of the following years as a percentage of the base year’s amount for that item.
Objective 2 - Perform a vertical analysis of financial statements.

Vertical analysis of a financial statement reveals the percentage of the total that each statement item represents. Percentages on the comparative income statement are computed by dividing all amounts by net sales. Percentages on the comparative balance sheet are shown as either 1) a percentage of total assets or 2) a percentage of total liabilities and shareholders’ equity.

Vertical analysis of the income statement over time highlights changes in such items as the gross profit percentage and net income.

Vertical analysis of the balance sheet shows the composition of balance sheet items. Trend analysis can be used to highlight year-to-year percentage changes.

(Review Exhibits 18-4 and 18-5 in your text.)

Objective 3 - Prepare common-size financial statements.

Common-size statements report amounts in percentages only. The common-size statement is a form of vertical analysis. On a common-size income statement, each item is expressed as a percentage of the net sales amount. In the balance sheet, the common-size is the total on each side of the accounting equation. Note that common-size percentages are the same percentages shown on financial statements using vertical analysis. (Review Exhibit 18-6 in your text.)

Benchmarking is the practice of comparing a company’s performance with other companies or companies. Benchmarking is also used to compare a company’s results with the average for its industry. In addition, common-size statements can be compared with those of specific competitors within the industry. Exhibit 18-7 in your text illustrate these two uses of benchmarking.

Common-size percentages can be used to compare financial statements of different companies or to compare one company’s financial statements to industry averages.

Objective 4 - Compute the standard financial ratios.

There are many, many different ratios used in financial analysis. Sometimes a ratio is used alone but more frequently a group of ratios is calculated and used to analyze a particular issue. The ratios discussed in this section are grouped as follows:

1. Ratios that measure the company’s ability to pay current liabilities
2. Ratios that measure the company’s ability to sell inventory and collect receivables
3. Ratios that measure the company’s ability to pay short-term and long-term debt
4. Ratios that measure the company’s profitability
5. Ratios used to analyze the company’s shares as an investment
1. Ratios that measure the company’s ability to pay current liabilities

**Working capital** is used to measure a business’s ability to meet its short-term obligations with its current assets.

\[
\text{WORKING CAPITAL} = \text{CURRENT ASSETS} - \text{CURRENT LIABILITIES}
\]

The **current ratio** is used to measure the availability of sufficient current assets to maintain normal business operations.

\[
\text{CURRENT RATIO} = \frac{\text{CURRENT ASSETS}}{\text{CURRENT LIABILITIES}}
\]

The **acid-test (or quick) ratio** measures the ability of a business to pay all of its current liabilities if they came due immediately.

\[
\text{ACID-TEST RATIO} = \frac{\text{CASH} + \text{AVAILABLE-FOR-SALE} + \text{NET CURRENT INVESTMENTS}}{\text{CURRENT LIABILITIES}}
\]

**Study Tip:** Inventory and prepaid expenses are not used to compute the acid-test ratio.

2. Ratios that measure the company’s ability to sell inventory and collect receivables

**Inventory turnover** is a measure of the number of times a company sells an average level of inventory during a year.

\[
\text{INVENTORY TURNOVER} = \frac{\text{COST OF GOODS SOLD}}{\text{AVERAGE INVENTORY}}
\]

\[
\text{AVERAGE INVENTORY} = \frac{\text{BEGINNING INVENTORY} + \text{ENDING INVENTORY}}{2}
\]

**Accounts receivable turnover** measures the ability of a company to collect cash from its credit customers.

\[
\text{ACCOUNTS RECEIVABLE TURNOVER} = \frac{\text{NET CREDIT SALES}}{\text{AVERAGE NET ACCOUNTS RECEIVABLE}}
\]

\[
\text{AVERAGE NET ACCOUNTS RECEIVABLE} = \frac{\text{BEGINNING NET ACCOUNTS RECEIVABLE} + \text{ENDING NET ACCOUNTS RECEIVABLE}}{2}
\]

**Days’ sales in receivables** measures in sales days the value of accounts receivable; it tells how many days’ sales remain uncollected (in accounts receivable).
ONE DAY’S SALES = NET SALES
365

DAYS’ SALES IN ACCOUNTS RECEIVABLE = AVERAGE NET ACCOUNTS RECEIVABLE ONE DAY’S SALES

To compute the ratio for the beginning of the year, substitute beginning net Accounts Receivable for average net Accounts Receivable. To compute the ratio for the end of the year, substitute ending net Accounts Receivable for average net Accounts Receivable.

3. Ratios that measure the company’s ability to pay short-term and long-term debt

The debt ratio measures the relationship between total liabilities and total assets.

DEBT RATIO = TOTAL LIABILITIES
TOTAL ASSETS

The times-interest-earned ratio measures the ability of a business to pay interest expense.

TIMES-INTEREST-EARNED RATIO = INCOME FROM OPERATIONS
INTEREST EXPENSE

Remember that income from operations does not include interest revenue, interest expense, or income tax expense.

4. Ratios that measure the company’s profitability

Rate of return on net sales measures the relationship between net income and sales.

RATE OF RETURN ON NET SALES = NET INCOME
NET SALES

Rate of return on total assets measures the success a company has in using its assets to earn a profit.

RATE OF RETURN ON TOTAL ASSETS = NET INCOME + INTEREST EXPENSE
AVERAGE TOTAL ASSETS

AVERAGE TOTAL ASSETS = BEGINNING TOTAL ASSETS + ENDING TOTAL ASSETS
2
The rate of return on common shareholders’ equity shows the relationship between net income and the common shareholders’ investment in the company.

\[
\text{RATE OF RETURN ON COMMON SHAREHOLDERS’ EQUITY} = \frac{\text{NET INCOME} - \text{PREFERRED DIVIDENDS}}{\text{AVERAGE COMMON SHAREHOLDERS’ EQUITY}}
\]

\[
\text{AVERAGE COMMON SHAREHOLDERS’ EQUITY} = \frac{\text{BEGINNING} + \text{ENDING COMMON SHAREHOLDERS’ EQUITY}}{2}
\]

Earnings per share (EPS) is the amount of net income per share of the company’s common shares.

\[
\text{EPS} = \frac{\text{NET INCOME} - \text{PREFERRED DIVIDENDS}}{\text{NUMBER OF COMMON SHARES OUTSTANDING}}
\]

**Study Tip:** Remember, if the number of shares outstanding has changed during the year, the denominator is changed to reflect the weighted-average number of shares outstanding.

5. Ratios used to analyze the company’s shares as an investment

The price/earnings (P/E) ratio is the ratio of the market price of a common share to the company’s EPS.

\[
\text{PRICE/EARNINGS RATIO} = \frac{\text{MARKET PRICE PER COMMON SHARE}}{\text{EARNINGS PER SHARE}}
\]

Dividend yield is the ratio of dividends per share to the share’s market price per share.

\[
\text{DIVIDENDS YIELD ON COMMON SHARES} = \frac{\text{DIVIDENDS PER COMMON SHARE}}{\text{MARKET PRICE PER COMMON SHARE}}
\]

The formula for calculating book value per common share is:

\[
\text{BOOK VALUE PER COMMON SHARE} = \frac{\text{TOTAL SHAREHOLDERS’ EQUITY} - \text{PREFERRED EQUITY}}{\text{NUMBER OF COMMON SHARES OUTSTANDING}}
\]

Ratios should be 1) evaluated over a period of years, and 2) compared with industry standards.

When a problem is found, the items used to compute the ratio should be analyzed to determine the nature of the problem. At that time, possible solutions to the problem can be suggested.

In an efficient capital market, share prices reflect all information that is available to the public. Financial statement analysis helps to identify and evaluate the inherent risks in potential investments.
TEST YOURSELF

All the self-testing materials in this chapter focus on information and procedures that your instructor is likely to test in quizzes and examinations.

I. Matching  Match each numbered term with its lettered definition.

_____ 1. accounts receivable turnover  _____ 11. current ratio
_____ 2. working capital  _____ 12. debt ratio
_____ 3. common-size statements  _____ 13. horizontal analysis
_____ 4. days’ sales in receivables  _____ 14. price/earnings ratio
_____ 5. dividend yield  _____ 15. return on net sales
_____ 6. inventory turnover  _____ 16. book value per common share
_____ 7. return on total assets  _____ 17. return on common shareholders’ equity
_____ 8. times-interest-earned ratio  _____ 18. benchmarking
_____ 9. vertical analysis  _____ 19. cost of capital
_____ 10. acid-test ratio  _____ 20. nonfinancial data

A. analysis of a financial statement that reveals the relationship of each statement item to the total, which is the 100% figure
B. common shareholders’ equity divided by the number of common shares outstanding
C. current assets divided by current liabilities
D. current assets minus current liabilities
E. financial statements that report only percentages (no dollar amounts)
F. measures the number of times that operating income can cover interest expense
G. measures the number of times a company sells its average level of inventory during a year
H. ratio of the market price of a common share to the company’s earnings per share
I. measures the success a company has in using its assets to earn a profit
J. net income minus preferred dividends, divided by average common shareholders’ equity; a measure of profitability
K. ratio of average net accounts receivable to one day’s sales
L. ratio of dividends per share to the market price per share
M. ratio of net income to net sales; a measure of profitability
N. study of percentage changes in comparative financial statements
O. tells the proportion of a company’s assets that it has financed with debt
P. tells whether an entity could pay all its current liabilities if they came due immediately
Q. the ratio of net credit sales to average net accounts receivable; it measures ability to collect cash from credit customers
R. a letter written by the company president offering explanation for the high incidence in turnover of top managers
S. the practice of comparing a company with other companies with a view toward improvement
T. a weighted average of the returns demanded by the company’s shareholders and lenders
II. Multiple Choice  
*Circle the best answer.*

1. In vertical analysis the relationship between net income and net sales is shown by the:
   
   A. income from operations percentage  
   B. net income percentage  
   C. rate of return on sales  
   D. gross margin percentage

2. Which of the following measures profitability?
   
   A. debt ratio  
   B. current ratio  
   C. dividend yield  
   D. earnings per common share

3. Which of the following current assets is *not* used to compute the acid-test ratio?
   
   A. accounts receivable  
   B. cash  
   C. prepaid expenses  
   D. short-term investments

4. Which of the following is a common measure of a firm’s ability to meet short-term obligations?
   
   A. working capital  
   B. rate of return on sales  
   C. net assets  
   D. price/earnings ratio

5. The times-interest-earned ratio measures:
   
   A. profitability  
   B. ability to pay interest expense on debt  
   C. ability to pay current liabilities  
   D. ability to collect receivables

6. The proportion of a firm’s assets financed by debt is measured by the:
   
   A. current ratio  
   B. debt ratio  
   C. debt yield ratio  
   D. times-interest-earned ratio

7. Assume that a company’s current ratio is greater than one. If the company pays current liabilities with cash, the new current ratio will:
   
   A. increase  
   B. decrease  
   C. remain unchanged  
   D. cannot be determined

8. The dividend yield evaluates:
   
   A. the ability to pay current debt  
   B. profitability  
   C. shares as an investment  
   D. ability to pay long-term debt

9. The excess of current assets less current liabilities is:
   
   A. a measure of profitability  
   B. net income  
   C. a measure of short-term liquidity  
   D. a measure of long-term debt paying ability
10. Book value measures:

A. profitability  
B. short-term liquidity  
C. long-term debt paying ability  
D. shares as an investment

III. Completion  Complete each of the following statements.

1. The study of percentage changes in comparative financial statements is called ________________ analysis.
2. Vertical analysis percentages on the income statement are computed by dividing all amounts by ________________.
3. Vertical analysis percentages on the balance sheet are computed by dividing all amounts by ________________.
4. Working capital is ________________________________________________.
5. _______________ and _______________ are the two most common measures of firm size.
6. Leverage ________________________ the risk to common shareholders.
7. The ______________________ ratio indicates the market price of one dollar of earnings.
8. The rate of return on total assets equals ________________________________.
9. The most widely quoted of all financial statistics is ________________________________.
10. The _______________________________ is the recorded accounting value of each common share outstanding.

IV. Daily Exercises

1. Net income was $600,000 in Year 1, $800,000 in Year 2, and $640,000 in Year 3. What were the percentage changes in net income?

2. A company had 300,000 common shares outstanding at the beginning of the year. On March 1, the company sold 200,000 additional shares, and on June 30, it exchanged 150,000 shares for bonds that were converted. On November 1, the company purchased 100,000 common shares. Net income for the year was $1,570,000. Calculate earnings per share.
3. Complete a vertical analysis using the following information.

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>2,532,651</td>
<td></td>
</tr>
<tr>
<td>Cost of products sold</td>
<td>1,123,459</td>
<td></td>
</tr>
<tr>
<td>Selling, delivery, and administration</td>
<td>543,804</td>
<td></td>
</tr>
<tr>
<td>Advertising</td>
<td>348,521</td>
<td></td>
</tr>
<tr>
<td>Research and development</td>
<td>50,489</td>
<td></td>
</tr>
<tr>
<td>Interest expense</td>
<td>55,623</td>
<td></td>
</tr>
<tr>
<td>Other (income) expense, net</td>
<td>(5,260)</td>
<td></td>
</tr>
<tr>
<td>Total costs and expenses</td>
<td>2,116,636</td>
<td></td>
</tr>
<tr>
<td>Earnings before income taxes</td>
<td>416,015</td>
<td></td>
</tr>
<tr>
<td>Income Taxes</td>
<td>166,573</td>
<td></td>
</tr>
<tr>
<td>Net earnings</td>
<td>249,442</td>
<td></td>
</tr>
</tbody>
</table>

4. Examine your results in Daily Exercise #3, and calculate the gross margin rate.

5. Presented below are net sales (in thousands) and net earnings (in thousands) for the past five years. Calculate trend percentages.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>2,532,651</td>
<td>2,217,843</td>
<td>1,984,170</td>
<td>1,836,949</td>
<td>1,634,171</td>
</tr>
<tr>
<td>Net Earnings</td>
<td>249,442</td>
<td>222,092</td>
<td>200,832</td>
<td>212,057</td>
<td>167,051</td>
</tr>
</tbody>
</table>

V. Exercises

1. Alberta Corporation had the following information for 2009:

   Cost of goods sold $800,000
   Beginning inventory 60,000
   Ending inventory 120,000
   Net credit sales 1,450,000
   Beginning accounts receivable 150,000
   Ending accounts receivable 170,000
A. What is inventory turnover?

B. What is the accounts receivable turnover?

C. What is the days’ sales in average receivables?

2. The following information is given for Saratoga Corporation for 2008:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$1,650,000</td>
</tr>
<tr>
<td>Net income</td>
<td>120,000</td>
</tr>
<tr>
<td>Average common shareholders’ equity</td>
<td>6,300,000</td>
</tr>
<tr>
<td>Average total assets</td>
<td>8,450,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>150,000</td>
</tr>
<tr>
<td>Preferred dividends</td>
<td>40,000</td>
</tr>
<tr>
<td>Common dividends</td>
<td>110,000</td>
</tr>
<tr>
<td>Common shares outstanding</td>
<td>240,000 shares</td>
</tr>
</tbody>
</table>

A. What is the rate of return on net sales?

B. What is the rate of return on total assets?

C. What is the rate of return on common shareholders’ equity?
3. The following information is given for Eastern Corporation:

**Assets:**
- Cash $  60,000
- Held-for-trading investments  118,000
- Accounts receivable  214,000
- Inventory  141,000
- Property, plant, and equipment  420,000

**Total assets** $953,000

**Liabilities and Shareholders’ equity:**
- Accounts payable $105,000
- Salary payable  17,000
- Long-term bonds payable  165,000
- Common shares  200,000
- Retained earnings  466,000

**Total liabilities and shareholders’ equity** $953,000

A. What is the current ratio?

B. What is the acid-test (quick) ratio?

C. What is the debt ratio?

4. Modafina Inc. has a price/earnings ratio of 9.5, dividends of $0.75 per share, and earnings per share of $0.64.

A. What is the market price per share?

B. What is the dividend yield?
VI. Beyond the Numbers

The operating cycle is the length of time between the purchase of merchandise and its conversion to cash following the sale and receipt of payment (you were introduced to the operating cycle in Chapter 5). Using the information in Exercise #1 above, calculate the operating cycle for Alberta Corporation.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

VII. Demonstration Problems

Demonstration Problem #1

The Clog Company Ltd., headquartered in Burnaby, British Columbia, manufactures shoes. Figures from their 2008 annual report (slightly modified for ease of presentation) follow:

The Clog Company Ltd.
Statement of Consolidated Earnings
For the Year Ended December 31, 2008

(In thousands)

Net sales \( \$1,073,022 \)

Cost and expenses
Cost of products sold \( \$687,103 \)
Selling, delivery, and administration \( 241,711 \)
Advertising \( 15,607 \)
Research and development \( 3,963 \)
Interest expense \( 17,546 \)
Other (income) expense, net \( 1,827 \)
Total costs and expenses \( \$967,757 \)

Earnings before income taxes \( \$105,265 \)
Income Taxes \( 43,819 \)
Net earnings \( \$61,446 \)
Weighted-average number of shares outstanding \( 42,600 \)
The Clog Company Ltd.
Consolidated Balance Sheet
December 31, 2008

(In thousands)

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and held-for-trading investments</td>
<td>$8,326</td>
<td>$5,225</td>
</tr>
<tr>
<td>Accounts receivable, less allowance</td>
<td>125,126</td>
<td>121,763</td>
</tr>
<tr>
<td>Inventories</td>
<td>146,002</td>
<td>156,245</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>20,155</td>
<td>34,038</td>
</tr>
<tr>
<td>Future tax assets</td>
<td>4,662</td>
<td>3,561</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$304,271</td>
<td>$320,832</td>
</tr>
<tr>
<td>Property, plant, and equipment—net</td>
<td>319,677</td>
<td>290,960</td>
</tr>
<tr>
<td>Brands, trademarks, patents and other intangibles—net</td>
<td>204,422</td>
<td>202,323</td>
</tr>
<tr>
<td>Other assets</td>
<td>32,510</td>
<td>25,831</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>$860,880</td>
<td>$839,946</td>
</tr>
</tbody>
</table>

|                          |       |       |
| **Liabilities and Shareholders’ Equity** |       |       |
| Current liabilities:     |       |       |
| Accounts payable         | $61,168 | $70,106 |
| Accrued liabilities      | 110,522 | 144,863 |
| Short-term debt          | 3,474   | 27,279 |
| Income tax payable       | 4,013   | 5,128  |
| Current maturity of long-term debt | 116   | 912   |
| Total current liabilities| $179,293 | $248,288 |
| Long-term debt           | 199,355 | 166,279 |
| Other obligations        | 17,107  | 18,677 |
| Future income tax liability | 66,300 | 54,524 |
| **Shareholders’ equity** |       |       |
| Common shares - 50,000,000 shares authorized, 43,140,586 issued and outstanding | $64,979 | $73,529 |
| Retained earnings        | 333,846 | 278,649 |
| **Total shareholders’ equity** | $398,825 | $352,178 |
| **Total liabilities and shareholders’ equity** | $860,880 | $839,946 |

**Required:**

Assume annual dividends of $1.16 and a market price of $11.12 per share. Compute the following for 2008:

A) working capital
B) current ratio

C) acid-test (quick) ratio

D) inventory turnover

E) accounts receivable turnover

F) days’ sales in receivables

G) number of days in operating cycle

H) debt ratio

I) times-interest-earned ratio

J) rate of return on sales
K) rate of return on total assets

L) rate of return on common shareholders’ equity

M) earnings per share

N) price/earnings ratio

O) dividend yield

P) book value per common share
Demonstration Problem #2

Killoran Corporation’s balance sheets and income statements are presented below:

### Killoran Corporation

#### Balance Sheet

**December 31**

<table>
<thead>
<tr>
<th>Assets</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$13,300</td>
<td>$20,350</td>
</tr>
<tr>
<td>Held-for-trading investments</td>
<td>8,200</td>
<td>8,000</td>
</tr>
<tr>
<td>Receivables, net</td>
<td>26,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>45,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>2,500</td>
<td>4,650</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>$95,000</td>
<td>$97,000</td>
</tr>
<tr>
<td><strong>Plant and equipment—net</strong></td>
<td>185,680</td>
<td>196,500</td>
</tr>
<tr>
<td>Land</td>
<td>40,000</td>
<td>35,000</td>
</tr>
<tr>
<td><strong>Intangibles and other assets</strong></td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$323,080</td>
<td>$330,900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities and Shareholders’ Equity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current liabilities:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$10,000</td>
<td>$10,500</td>
</tr>
<tr>
<td>Current installments of long-term debt</td>
<td>3,550</td>
<td>3,445</td>
</tr>
<tr>
<td>Accounts payable-trade</td>
<td>14,447</td>
<td>18,500</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>3,670</td>
<td>1,605</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>$31,667</td>
<td>$34,050</td>
</tr>
<tr>
<td>Long-term debt, less current installments</td>
<td>95,500</td>
<td>93,330</td>
</tr>
<tr>
<td>Obligation under capital lease, less current portion</td>
<td>1,100</td>
<td>2,150</td>
</tr>
<tr>
<td>Future income taxes</td>
<td>4,813</td>
<td>4,370</td>
</tr>
<tr>
<td><strong>Total common shareholders’ equity</strong></td>
<td>190,000</td>
<td>197,000</td>
</tr>
<tr>
<td><strong>Total liabilities and shareholders’ equity</strong></td>
<td>$323,080</td>
<td>$330,900</td>
</tr>
</tbody>
</table>
Killoran Corporation
Income Statements
For the Years Ended December 31

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$416,500</td>
<td>$406,316</td>
</tr>
<tr>
<td>Cost and expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>322,593</td>
<td>315,812</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>41,219</td>
<td>43,200</td>
</tr>
<tr>
<td></td>
<td>363,812</td>
<td>359,012</td>
</tr>
<tr>
<td>Income from operations</td>
<td>52,688</td>
<td>47,304</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,251</td>
<td>3,150</td>
</tr>
<tr>
<td>Earnings before income taxes</td>
<td>49,437</td>
<td>44,154</td>
</tr>
<tr>
<td>Income taxes</td>
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<td>6,554</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 42,000</td>
<td>$ 37,600</td>
</tr>
</tbody>
</table>

**Required:**

1. Prepare a horizontal analysis for 2009 of the balance sheet, using the 2008 amounts as the base.
## Liabilities and shareholders’ equity

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$10,000</td>
<td>$10,500</td>
</tr>
<tr>
<td>Current installments of long-term debt</td>
<td>3,550</td>
<td>3,445</td>
</tr>
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<td>1,605</td>
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</table>

2. Convert the 2009 and 2008 income statements to common-size statements, using net sales as the base figures.

### Killoran Corporation

#### Income Statements

**For the Years Ended December 31**

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount</td>
<td>%</td>
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SOLUTIONS

I. Matching


II. Multiple Choice

1. C  The rate of return on sales is net income / net sales.
2. D  Debt ratio measures the ability to pay long-term debts. Current ratio measures ability to pay current liabilities. Dividend yield is used in analyzing shares as an investment.
3. C  Only the most liquid current assets are used to calculate the acid-test ratio.
4. A  Working capital is current assets less current liabilities. It measures a firm’s ability to meet short-term obligations.
5. B  Times-interest-earned measures how many times operating income is greater than interest expense.
6. B  Current ratio measures the ability to pay current liabilities. Debt yield ratio has no meaning. Times-interest-earned ratio measures ability to pay interest on debt. The debt ratio is total liabilities / total assets.
7. A  Let CA = current assets, CL = current liabilities, and X = the amount of cash paid on current liabilities. Then given that CA > CL (or CL < CA), show that:
   \[
   \frac{CA - X}{CL - X} > \frac{CA}{CL}
   \]
   \[
   CL(CA - X) > CA(CL - X)
   \]
   \[
   CL(CA) - CL(X) > CA(CL) - CA(X)
   \]
   \[
   -CL(X) > -CA(X)
   \]
   dividing by -X:  \( CL < CA \)

   **Study Tip:** In a firm with current assets greater than current liabilities, the current ratio can be improved by using cash to pay current liabilities.

8. C  Dividend yield compares the amount of dividend per share with the current market price and therefore is one way to evaluate shares as a potential investment.
9. C  Working capital (the excess of current assets over current liabilities) measures short-term liquidity.
10. D  Book value indicates the value of each common share outstanding and is one way to analyze a share investment.
III. Completion

1. horizontal
2. net sales
3. total assets (or total liabilities plus shareholders’ equity)
4. current assets minus current liabilities
5. Net sales, total assets
6. increases (Leverage is the practice of increasing the debt financing of an entity with respect to owner financing. Leverage is a two-edged sword, increasing profits (and returns to shareholders’) during good times but compounding losses during bad times.)
7. price/earnings
8. (net income plus interest expense) / average total assets
9. earnings per share
10. book value per common share

IV. Daily Exercises

1. Year 2 = $200,000 / $600,000 = 33.33%
   Year 3 = ($160,000) / $800,000 = (20%)

2. 
   \[
   \begin{align*}
   300,000 \times \frac{2}{12} &= 50,000 \\
   500,000 \times \frac{4}{12} &= 166,667 \\
   650,000 \times \frac{4}{12} &= 216,667 \\
   550,000 \times \frac{2}{12} &= 91,667 \\
   \hline
   & 525,001
   \end{align*}
   \]

   $1,570,000 \div 525,001 = $2.99 (rounded)

**Study Tip:** When the number of outstanding shares has changed during the year, the denominator must reflect the weighted-average number of shares.

3. 

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$2,532,651</td>
<td>100%</td>
</tr>
<tr>
<td>Cost of products sold</td>
<td>1,123,459</td>
<td>44.4%</td>
</tr>
<tr>
<td>Selling, delivery, and administration</td>
<td>543,804</td>
<td>21.5%</td>
</tr>
<tr>
<td>Advertising</td>
<td>348,521</td>
<td>13.8%</td>
</tr>
<tr>
<td>Research and development</td>
<td>50,489</td>
<td>2.0%</td>
</tr>
<tr>
<td>Interest expense</td>
<td>55,623</td>
<td>2.2%</td>
</tr>
<tr>
<td>Other (income) expense, net</td>
<td>(5,260)</td>
<td>(.2)%</td>
</tr>
<tr>
<td>Total costs and expenses</td>
<td>$2,116,636</td>
<td>83.6%</td>
</tr>
<tr>
<td>Earnings before income taxes</td>
<td>416,015</td>
<td>16.4%</td>
</tr>
<tr>
<td>Income Taxes</td>
<td>166,573</td>
<td>6.6%</td>
</tr>
<tr>
<td>Net earnings</td>
<td>$249,442</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

4. If cost of products sold is 44.4% of net sales, the gross margin (gross margin = net sales - cost of products sold) must be 55.6% (100% - 44.4%).
5.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>155%</td>
<td>136%</td>
<td>121%</td>
<td>112%</td>
<td>100%</td>
</tr>
<tr>
<td>Net Earnings</td>
<td>149%</td>
<td>133%</td>
<td>120%</td>
<td>127%</td>
<td>100%</td>
</tr>
</tbody>
</table>

V. Exercises

1. A. Cost of goods / Average inventory = \([800,000 / (60,000 + 120,000) / 2]\) = 8.89
   B. Net credit sales / Average accounts receivable = \([1,450,000 / (150,000 + 170,000) / 2]\) = 9.06
   C. Average accounts receivable / One day’s sales = \([($150,000 + $170,000) / 2] / (1,450,000 / 365)\) = 40.3 days

2. A. Net income / Net sales = $120,000 / $1,650,000 = 0.073 = 7.3%
   B. (Net income + Interest expense) / Average total assets = ($120,000 + $150,000) / $8,450,000 = 0.032 = 3.2%
   C. (Net income - Preferred dividends) / Average common shareholders’ equity = ($120,000 - $40,000) / $6,300,000 = 0.013 = 1.3%

3. A. Current assets / Current liabilities = ($60,000 + $118,000 + $214,000 + $141,000) / ($105,000 + $17,000) = 4.4 (rounded)
   B. (Cash + Held-for-trading investments + Net current receivables) / Current liabilities = ($60,000 + $118,000 + $214,000) / ($105,000 + $17,000) = 3.2

   [Study Tip: Remember only the assets that will convert to cash “quickly” are called quick assets. Inventory does not do this.]

   C. Total liabilities / Total assets = ($105,000 + $17,000 + $165,000) / $953,000 = 0.301 = 30.1%

4. A. Market price per common share / Earnings per share = P / $0.64 = 9.5; P = $6.08
   B. Dividends per common share / Market price per common share = $0.75 / $6.08 = 0.121 = 12.1%

VI. Beyond the Numbers

The operating cycle for Alberta Corporation is 81 days (rounded). Instruction (C) in the exercise asked you to calculate the days’ sales in average receivables. The correct figure was 40.3 days. Another way of characterizing this result is to say that it takes approximately 40 days to collect an average account receivable. Instruction (A) asked you to calculate inventory turnover. The correct amount was 8.89—in other words, inventory “turns” slightly less than 9 times each year. Divide this result into 365 to convert it to days, or 41 days. In other words, on average it takes 41 days for an item to sell and 40 days on average to collect a receivable. Therefore, the operating cycle is 81 days.
VII. Demonstration Problems

Demonstration Problem #1 Solved and Explained

A) working capital = current assets - current liabilities = $304,271 – $179,293 = $124,978

B) current ratio = current assets / current liabilities = $304,271 / $179,293 = 1.7 (rounded)

C) acid-test (quick) = quick assets / current liabilities
= ($8,326 + $125,126) / $179,293 = 0.74 (rounded)

This means Clog has 74 cents of quick assets (cash and held-for-trading investment plus net accounts receivable) for every dollar of current liability.

D) inventory turnover = cost of goods sold / average inventory
= $687,103 / [($156,245 + $146,002) / 2] = 4.55 times

Clog “turns” its inventory 4.55 times each year. Another way of stating this ratio is to convert it to days by dividing the “turn” into 365. For Clog, the turnover averages 80 days (365 / 4.55).

E) accounts receivable turnover = net credit sales / average accounts receivable
= $1,073,022 / [($121,763 + $125,126) / 2] = 8.69 times

F) days’ sales in receivables = average net accounts receivable / one day’s sales
= $123,444 / ($1,073,022 / 365) = 42 days

The numerator for this ratio was the denominator for the previous ratio.

G) operating cycle = inventory turn + days’ sales in receivables = 80 + 42 = 122 days

H) debt ratio = total liabilities / total assets
= $462,055 / $860,880
= 0.537 or 53.7%

This means that 53.7% of The Clog’s assets were financed with debt. Notice the numerator (total liabilities) was not presented on the balance sheet but had to be calculated by adding together total current liabilities, long-term debt, other obligations, and deferred income taxes.

I) times-interest-earned = income from operations / interest expense
= ($105,265 +$17,546) / $17,546 = $122,811 / $17,546
= 7 times

Note we used earnings before income taxes plus interest expense as the numerator because interest expense had already been deducted from the earnings before income taxes amount.

J) rate of return on sales = net income / net sales
= $61,446 / $1,073,022
= 0.057 or 5.7%
K) rate of return on total assets = \( \frac{\text{net income} + \text{interest expense}}{\text{average total assets}} \)
\[ = \frac{($61,446 + $17,546)}{[(839,946 + 860,880) / 2]} \]
\[ = 0.093 \text{ or } 9.3\% \]

This ratio measures the return on assets generated by this year’s operations.

L) rate of return on common shareholders’ equity = \( \frac{\text{net income} - \text{preferred dividends}}{\text{average common shareholders’ equity}} \)
\[ = \frac{($61,446 - 0)}{[(352,178 + 398,825) / 2]} \]
\[ = 0.164 \text{ or } 16.4\% \]

Clog does not have preferred shares outstanding, so the numerator is the same as net earnings.

M) earnings per share = \( \frac{\text{net income} - \text{preferred dividends}}{\text{weighted average number of common shares outstanding}} \)
\[ = \frac{$61,445}{42,600} \]
\[ = $1.44 \text{ (rounded)} \]

This should be calculated for each “net earnings” amount. Companies are required to include these per share amounts on the income statement, not in the footnotes.

N) price/earnings ratio = \( \frac{\text{market price per common share}}{\text{earnings per share}} \)
\[ = \frac{11.12}{1.44} = 7.7 \text{ (rounded)} \]

O) dividend yield = \( \frac{\text{dividend per common share}}{\text{market price of common share}} \)
\[ = \frac{1.16}{11.12} \]
\[ = 0.104 \text{ or } 10.4\% \]

P) book value per common share = \( \frac{\text{total shareholders’ equity} - \text{preferred equity}}{\text{number of common shares outstanding}} \)
\[ = \frac{398,825,000}{43,140,586} \]
\[ = $9.24 \text{ per share} \]

The dollars are presented “in thousands,” so you must add three zeroes to the total shareholders’ equity amount.

As emphasized in your text, these ratios would have more meaning if you did them over consecutive years. In addition, to evaluate a company properly, you would also want to compare the ratios with those of competitors and with the industry as a whole.
### Demonstration Problem #2 Solved and Explained

1. **Killoran Corporation**

   **Balance Sheet**

   **December 31**

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>2009</th>
<th>2008</th>
<th>Increase/Decrease</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$13,300</td>
<td>$20,350</td>
<td>$(7,050)</td>
<td>(34.6)</td>
</tr>
<tr>
<td>Held-for-trading investments</td>
<td>8,200</td>
<td>8,000</td>
<td>200</td>
<td>2.5</td>
</tr>
<tr>
<td>Receivables, net</td>
<td>26,000</td>
<td>24,000</td>
<td>2,000</td>
<td>8.3</td>
</tr>
<tr>
<td>Inventories</td>
<td>45,000</td>
<td>40,000</td>
<td>5,000</td>
<td>12.5</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>2,500</td>
<td>4,650</td>
<td>$(2,150)</td>
<td>(46.2)</td>
</tr>
<tr>
<td>Total current assets</td>
<td>95,000</td>
<td>97,000</td>
<td>$(2,000)</td>
<td>(2.1)</td>
</tr>
<tr>
<td>Plant and equipment — net</td>
<td>185,680</td>
<td>196,500</td>
<td>(10,820)</td>
<td>(5.5)</td>
</tr>
<tr>
<td>Land</td>
<td>40,000</td>
<td>35,000</td>
<td>5,000</td>
<td>14.3</td>
</tr>
<tr>
<td>Intangibles and other assets</td>
<td>2,400</td>
<td>2,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$323,080</strong></td>
<td><strong>$330,900</strong></td>
<td><strong>$(7,820)</strong></td>
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</tr>
</tbody>
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## Killoran Corporation

### Income Statements

**Years 2009 and 2008**

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</tr>
<tr>
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<td>$42,000</td>
<td>10.1</td>
<td>$37,600</td>
<td>9.3</td>
</tr>
</tbody>
</table>

### Points to remember:

1. When presenting horizontal analysis, each year’s change is divided by the base-year amount (in this case 2008) and converted to a percentage. While the change in any single item in any single year may not be significant, applying horizontal analysis over a number of years may highlight significant changes.

2. Common-size statements for a single year are only meaningful when the results are compared to other companies or industry data. However, common-size statements covering two or more years permit analysis of the particular company being examined. In this case, we see that 2009 results improved over 2008 due to lower cost of goods sold and lower operating expenses.

3. Financial ratios are mathematical formulas that quantify the relationship between two or more items reported in the financial statements. Ratios are used to assess and compare a firm’s liquidity, profitability, rate of return, and ability to meet debt obligations.

**Study Tip:** One of the most common mistakes students make is forgetting to use the average amount of inventory, accounts receivable, or shares outstanding in some of the formulas. It is important that an average be used to reduce distortions that might occur if only year-end balances were used.