Our discussion in this book focuses more on fundamental concepts and decisions in marketing than on financial details. However, marketers must understand the basic components of financial analyses if they are to explain and defend their decisions. In fact, they must be familiar with certain financial analyses to reach good decisions in the first place. To control and evaluate marketing activities, they must understand the income statement and what it says about the operations of their organization. They also need to be acquainted with performance ratios, which compare current operating results with past results and with results in the industry at large. We examine the income statement and some performance ratios in the first part of this appendix. In the last part, we discuss price calculations as the basis of price adjustments. Marketers are likely to use all these areas of financial analysis at various times to support their decisions and make necessary adjustments in their operations.

The Income Statement

The income, or operating, statement presents the financial results of an organization’s operations over a certain period. The statement summarizes revenues earned and expenses incurred by a profit center, whether a department, a brand, a product line, a division, or the entire firm. The income statement presents the firm’s net profit or net loss for a month, quarter, or year.

Table B.1 is a simplified income statement for Stoneham Auto Supplies, a fictitious retail store. The owners of the store, Rose Costa and Nick Schultz, see that net sales of $250,000 are decreased by the cost of goods sold and by other business expenses to yield a net income of $83,000. Of course, these figures are only highlights of the complete income statement, which appears in Table B.2.

The income statement can be used in several ways to improve the management of a business. First, it enables an owner or manager to compare actual results with budgets for various parts of the statement. For example, Rose and Nick see that the total amount of merchandise sold (gross sales) is $260,000. Customers returned merchandise or received allowances (price reductions) totaling $10,000. Suppose the budgeted amount was only $9,000. By checking the tickets for sales returns and allowances, the owners can determine why these events occurred and whether the $10,000 figure could be lowered by adjusting the marketing mix.

<table>
<thead>
<tr>
<th>Table B.1</th>
<th>Simplified Income Statement for a Retailer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stoneham Auto Supplies</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Income Statement for the Year Ended December 31, 2003</strong></td>
<td></td>
</tr>
<tr>
<td>Net Sales</td>
<td>$250,000</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>$45,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>$205,000</td>
</tr>
<tr>
<td>Expenses</td>
<td>$122,000</td>
</tr>
<tr>
<td>Net Income</td>
<td>$ 83,000</td>
</tr>
</tbody>
</table>

* We gratefully acknowledge the assistance of Jim L. Grimm, Professor of Marketing, Illinois State University, in writing this appendix.
After subtracting returns and allowances from gross sales, Rose and Nick can determine net sales, the amount the firm has available to pay its expenses. They are pleased with this figure because it is higher than their sales target of $240,000.

A major expense for most companies that sell goods (as opposed to services) is the cost of goods sold. For Stoneham Auto Supplies, it amounts to 18 percent of net sales. Other expenses are treated in various ways by different companies. In our example, they are broken down into standard categories of selling expenses, administrative expenses, and general expenses.

The income statement shows that for Stoneham Auto Supplies, the cost of goods sold was $45,000. This figure was derived in the following way. First, the statement shows that merchandise in the amount of $51,000 was purchased during the year. In
paying the invoices associated with these inventory additions, purchase (cash) discounts of $4,000 were earned, resulting in net purchases of $47,000. Special requests for selected merchandise throughout the year resulted in $2,000 in freight charges, which increased the net cost of delivered purchases to $49,000. When this amount is added to the beginning inventory of $48,000, the cost of goods available for sale during 2003 totals $97,000. However, the records indicate that the value of inventory at the end of the year was $52,000. Because this amount was not sold, the cost of goods that were sold during the year was $45,000.

Rose and Nick observe that the total value of their inventory increased by 8.3 percent during the year:

$$\frac{52,000 - 48,000}{48,000} = \frac{4,000}{48,000} = \frac{1}{12} = .0833\text{, or } 8.3\%$$

Further analysis is needed to determine whether this increase is desirable or undesirable. (Note that the income statement provides no details concerning the composition of the inventory held on December 31; other records supply this information.) If Nick and Rose determine that inventory on December 31 is excessive, they can implement appropriate marketing action.

Gross margin is the difference between net sales and cost of goods sold. Gross margin reflects the markup on products and is the amount available to pay all other expenses and provide a return to the owners. Stoneham Auto Supplies had a gross margin of $205,000:

<table>
<thead>
<tr>
<th>Net sales</th>
<th>$250,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of goods sold</td>
<td>$45,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>$205,000</td>
</tr>
</tbody>
</table>

Stoneham’s expenses (other than cost of goods sold) during 2003 totaled $122,000. Observe that $53,000, or slightly more than 43 percent of the total, constituted direct selling expenses:

$$\frac{53,000 \text{ selling expenses}}{122,000 \text{ total expenses}} = .434\text{, or } 43\%$$

The business employs three salespeople (one full time) and pays competitive wages. The selling expenses are similar to those in the previous year, but Nick and Rose wonder whether more advertising is necessary because the value of inventory increased by more than 8 percent during the year.

The administrative and general expenses are essential for operating the business. A comparison of these expenses with trade statistics for similar businesses indicates that the figures are in line with industry amounts.

Net income, or net profit, is the amount of gross margin remaining after deducting expenses. Stoneham Auto Supplies earned a net profit of $83,000 for the fiscal year ending December 31, 2003. Note that net income on this statement is figured before payment of state and federal income taxes.

Income statements for intermediaries and for businesses that provide services follow the same general format as that shown for Stoneham Auto Supplies in Table B.2. The income statement for a manufacturer, however, is somewhat different in that the “purchases” portion is replaced by “cost of goods manufactured.” Table B.3 shows the entire Cost of Goods Sold section for a manufacturer, including cost of goods manufactured. In other respects, income statements for retailers and manufacturers are similar.

**Performance Ratios**

Rose and Nick’s assessment of how well their business did during fiscal year 2003 can be improved through use of analytical ratios. Such ratios enable a manager to compare the results for the current year with data from previous years and industry statistics. However, comparisons of the current income statement with income statements and industry statistics from other years are not very meaningful because
factors like inflation are not accounted for when comparing dollar amounts. More meaningful comparisons can be made by converting these figures to a percentage of net sales, as this section shows.

The first analytical ratios we discuss, the operating ratios, are based on the net sales figure from the income statement.

**Operating Ratios**

Operating ratios express items on the income, or operating, statement as percentages of net sales. The first step is to convert the income statement into percentages of net sales, as illustrated in Table B.4.
After making this conversion, the manager looks at several key operating ratios: two profitability ratios (the gross margin ratio and the net income ratio) and the operating expense ratio.

For Stoneham Auto Supplies, these ratios are determined as follows (see Tables B.2 and B.4 for supporting data):

<table>
<thead>
<tr>
<th>Table B.4</th>
<th>Income Statement Components as Percentages of Net Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stoneham Auto Supplies</strong></td>
<td><strong>Income Statement as a Percentage of Net Sales for the Year Ended December 31, 2003</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Percentage of Net Sales</strong></td>
</tr>
<tr>
<td><strong>Gross Sales</strong></td>
<td>103.8%</td>
</tr>
<tr>
<td>Less: Sales returns and allowances</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Net Sales</strong></td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Cost of Goods Sold</strong></td>
<td>19.2%</td>
</tr>
<tr>
<td>Inventory, January 1, 2003 (at cost)</td>
<td>19.2%</td>
</tr>
<tr>
<td>Purchases</td>
<td>20.4%</td>
</tr>
<tr>
<td>Less: Purchase discounts</td>
<td>1.6</td>
</tr>
<tr>
<td>Net purchases</td>
<td>18.8%</td>
</tr>
<tr>
<td>Plus: Freight-in</td>
<td>0.8</td>
</tr>
<tr>
<td>Net cost of delivered purchases</td>
<td>19.6</td>
</tr>
<tr>
<td>Cost of goods available for sale</td>
<td>38.8%</td>
</tr>
<tr>
<td>Less: Inventory, December 31, 2003 (at cost)</td>
<td>20.8</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>18.0</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>82.0%</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
</tr>
<tr>
<td>Selling expenses</td>
<td></td>
</tr>
<tr>
<td>Sales salaries and commissions</td>
<td>12.8%</td>
</tr>
<tr>
<td>Advertising</td>
<td>6.4</td>
</tr>
<tr>
<td>Sales promotions</td>
<td>1.2</td>
</tr>
<tr>
<td>Delivery</td>
<td>0.8</td>
</tr>
<tr>
<td>Total selling expenses</td>
<td>21.2%</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td></td>
</tr>
<tr>
<td>Administrative salaries</td>
<td>8.0%</td>
</tr>
<tr>
<td>Office salaries</td>
<td>8.0</td>
</tr>
<tr>
<td>Office supplies</td>
<td>0.8</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0.4</td>
</tr>
<tr>
<td>Total administrative expenses</td>
<td>17.2%</td>
</tr>
<tr>
<td>General expenses</td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>5.6%</td>
</tr>
<tr>
<td>Utilities</td>
<td>2.8</td>
</tr>
<tr>
<td>Bad debts</td>
<td>0.4</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1.6</td>
</tr>
<tr>
<td>Total general expenses</td>
<td>10.4%</td>
</tr>
<tr>
<td><strong>Total expenses</strong></td>
<td>48.8</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>33.2%</td>
</tr>
</tbody>
</table>
Gross margin ratio = \frac{\text{Gross margin}}{\text{Net sales}} = \frac{\$205,000}{\$250,000} = 82\%

Net income ratio = \frac{\text{Net income}}{\text{Net sales}} = \frac{\$83,000}{\$250,000} = 33.2\%

Operating expenses ratio = \frac{\text{Total expense}}{\text{Net sales}} = \frac{\$122,000}{\$250,000} = 48.8\%

The gross margin ratio indicates the percentage of each sales dollar available to cover operating expenses and achieve profit objectives. The net income ratio indicates the percentage of each sales dollar that is classified as earnings (profit) before payment of income taxes. The operating expense ratio indicates the percentage of each dollar needed to cover operating expenses.

If Nick and Rose believe the operating expense ratio is higher than historical data and industry standards, they can analyze each operating expense ratio in Table B.4 to determine which expenses are too high and then take corrective action.

After reviewing several key operating ratios, Nick and Rose, like many managers, will probably want to analyze all the items on the income statement. By doing so, they can determine whether the 8 percent increase in the value of their inventory was necessary.

**Inventory Turnover Rate**

The inventory turnover rate, or stockturn rate, is an analytical ratio that can be used to answer the question, "Is the inventory level appropriate for this business?" The inventory turnover rate indicates the number of times an inventory is sold (turns over) during one year. To be useful, this figure must be compared with historical turnover rates and industry rates.

The inventory turnover rate is computed (based on cost) as follows:

\[
\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory at cost}}
\]

Rose and Nick would calculate the turnover rate from Table B.2 as follows:

\[
\frac{\text{Cost of goods sold}}{\text{Average inventory at cost}} = \frac{\$45,000}{\$50,000} = 0.9 \text{ times}\%
\]

Their inventory turnover is less than once per year (0.9 times). Industry averages for competitive firms are 2.8 times. This figure convinces Rose and Nick that their investment in inventory is too large and they need to reduce their inventory.

**Return on Investment**

Return on investment (ROI) is a ratio that indicates management’s efficiency in generating sales and profits from the total amount invested in the firm. For Stoneham Auto Supplies, the ROI is 41.5 percent, which compares well with competing businesses.

We use figures from two different financial statements to arrive at ROI. The income statement, already discussed, gives us net income. The balance sheet, which states the firm’s assets and liabilities at a given point in time, provides the figure for total assets (or investment) in the firm.

The basic formula for ROI is

\[\text{ROI} = \frac{\text{Net income}}{\text{Total investment}}\]

For Stoneham Auto Supplies, net income is $83,000 (see Table B.2). If total investment (taken from the balance sheet for December 31, 2003) is $200,000, then
ROI = \frac{83,000}{200,000} = 0.415, or 41.5% 

The ROI formula can be expanded to isolate the impact of capital turnover and the operating income ratio separately. Capital turnover is a measure of net sales per dollar of investment; the ratio is figured by dividing net sales by total investment. For Stoneham Auto Supplies,

\[
\text{Capital turnover} = \frac{\text{Net sales}}{\text{Total investment}} = \frac{250,000}{200,000} = 1.25
\]

ROI is equal to capital turnover times the net income ratio. The expanded formula for Stoneham Auto Supplies is

\[
\text{ROI} = \frac{\text{Net sales}}{\text{Total investment}} \times \frac{\text{Net income}}{\text{Net sales}}
\]

\[
= \frac{250,000}{200,000} \times \frac{83,000}{250,000}
\]

\[
= (1.25)(33.2\%) = 41.5\%
\]

**Price Calculations**

An important step in setting prices is selecting a basis for pricing, as discussed in Chapter 13. The systematic use of markups, markdowns, and various conversion formulas helps in calculating the selling price and evaluating the effects of various prices.

**Markups**

As indicated in the text, markup is the difference between the selling price and the cost of the item; that is, selling price equals cost plus markup. The markup must cover cost and contribute to profit; thus, markup is similar to gross margin on the income statement.

Markup can be calculated on either cost or selling price as follows:

\[
\frac{\text{Markup as percentage of cost}}{\text{Markup as percentage of selling price}} = \frac{\text{Amount added to cost}}{\text{Cost}} = \frac{\text{Dollar markup}}{\text{Cost}}
\]

\[
\frac{\text{Markup as percentage of selling price}}{\text{Markup as percentage of selling price}} = \frac{\text{Amount added to cost}}{\text{Selling price}} = \frac{\text{Dollar markup}}{\text{Selling price}}
\]

Retailers tend to calculate the markup percentage on selling price.

To review the use of these markup formulas, assume an item costs $10 and the markup is $5:

\[
\text{Selling price} = \text{Cost} + \text{Markup}
\]

\[
15 = 10 + 5
\]

Thus,

\[
\text{Markup percentage on cost} = \frac{5}{10} = 50\%
\]

\[
\text{Markup percentage on selling price} = \frac{5}{15} = 33\frac{1}{3}\%
\]

It is necessary to know the base (cost or selling price) to use markup pricing effectively. Markup percentage on cost will always exceed markup percentage on price, given the same dollar markup, as long as selling price exceeds cost.
On occasion, we may need to convert markup on cost to markup on selling price, or vice versa. The conversion formulas are

\[
\text{Markup percentage on selling price} = \frac{\text{Markup percentage on cost}}{100\% + \text{Markup percentage on cost}}
\]

\[
\text{Markup percentage on cost} = \frac{\text{Markup percentage on selling price}}{100\% - \text{Markup percentage on selling price}}
\]

For example, if the markup percentage on cost is 33 \(\frac{1}{3}\) percent, the markup percentage on selling price is

\[
\frac{33\frac{1}{3}\%}{100\% + 33\frac{1}{3}\%} = \frac{33\frac{1}{3}\%}{133\frac{1}{3}\%} = 25\%
\]

If the markup percentage on selling price is 40 percent, the corresponding percentage on cost is as follows:

\[
\frac{40\%}{100\% - 40\%} = \frac{40\%}{60\%} = 66\frac{2}{3}\%
\]

Finally, we can show how to determine selling price if we know the cost of the item and the markup percentage on selling price. Assume an item costs $36 and the usual markup percentage on selling price is 40 percent. Remember that selling price equals markup plus cost. Thus, if

\[
100\% = 40\% \text{ of selling price} + \text{Cost}
\]

then,

\[
60\% \text{ of selling price} = \text{Cost}
\]

In our example, cost equals $36. Therefore,

\[
0.6X = 36
\]

\[
X = \frac{36}{0.6} = 60
\]

Selling price = $60

Alternatively, the markup percentage could be converted to a cost basis as follows:

\[
\frac{40\%}{100\% - 40\%} = 66\frac{2}{3}\%
\]

The computed selling price would then be as follows:

\[
\text{Selling price} = 66\frac{2}{3}\% \times (\text{Cost}) + \text{Cost}
\]

\[
= 66\frac{2}{3}\% (36) + 36
\]

\[
= 24 + 36 = 60
\]

If you keep in mind the basic formula—selling price equals cost plus markup—you will find these calculations straightforward.

**Markdowns**

Markdowns are price reductions a retailer makes on merchandise. Markdowns may be useful on items that are damaged, priced too high, or selected for a special sales event. The income statement does not express markdowns directly because the change in price is made before the sale takes place. Therefore, separate records of markdowns would be needed to evaluate the performance of various buyers and departments.
The markdown ratio (percentage) is calculated as follows:

\[
\text{Markdown percentage} = \frac{\text{Dollar markdowns}}{\text{Net sales in dollars}}
\]

In analyzing their inventory, Nick and Rose discover three special automobile jacks that have gone unsold for several months. They decide to reduce the price of each item from $25 to $20. Subsequently, these items are sold. The markdown percentage for these three items is

\[
\text{Markdown percentage} = \frac{3($5)}{3($20)} = \frac{15}{60} = 25\%
\]

Net sales, however, include all units of this product sold during the period, not just those marked down. If ten of these items were already sold at $25 each, in addition to the three items sold at $20, the overall markdown percentage would be

\[
\text{Markdown percentage} = \frac{3($5)}{10($25) + 3($20)} = \frac{15}{250 + 60} = \frac{15}{310} = 4.8\%
\]

Sales allowances are also a reduction in price. Thus, the markdown percentage should include any sales allowances. It would be computed as follows:

\[
\text{Markdown percentage} = \frac{\text{Dollar markdowns} + \text{Dollar allowances}}{\text{Net sales in dollars}}
\]

**Discussion and Review Questions**

1. How does a manufacturer’s income statement differ from a retailer’s income statement?
2. Use the following information to answer questions a through c:

   **TEA Company**
   **Fiscal year ended June 30, 2003**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$500,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>300,000</td>
</tr>
<tr>
<td>Net income</td>
<td>50,000</td>
</tr>
<tr>
<td>Average inventory at cost</td>
<td>100,000</td>
</tr>
<tr>
<td>Total assets (total investment)</td>
<td>200,000</td>
</tr>
</tbody>
</table>

   a. What is the inventory turnover rate for TEA Company? From what sources will the marketing manager determine the significance of the inventory turnover rate?
   b. What is the capital turnover ratio? What is the net income ratio? What is the return on investment (ROI)?
   c. How many dollars of sales did each dollar of investment produce for TEA Company?
3. Product A has a markup percentage on cost of 40 percent. What is the markup percentage on selling price?
4. Product B has a markup percentage on selling price of 30 percent. What is the markup percentage on cost?
5. Product C has a cost of $60 and a usual markup percentage of 25 percent on selling price. What price should be placed on this item?
6. Apex Appliance Company sells 20 units of product Q for $100 each and 10 units for $80 each. What is the markdown percentage for product Q?