In the following financial statements for Spencer Company, we will use the information to demonstrate the calculation of the various ratios in profitability analysis.

### Spencer Company
**Comparative Balance Sheets**
**December 31,**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$210,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Receivables (net)</td>
<td>230,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>190,000</td>
<td>170,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>630,000</td>
<td>380,000</td>
</tr>
<tr>
<td><strong>Property, Plant and Equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Buildings</td>
<td>600,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>150,000</td>
<td>56,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(130,000)</td>
<td>(96,000)</td>
</tr>
<tr>
<td><strong>Total property, plant and equipment</strong></td>
<td>720,000</td>
<td>460,000</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$1,350,000</td>
<td>$840,000</td>
</tr>
<tr>
<td><strong>Current Liabilities:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$120,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Dividends payable</td>
<td>0</td>
<td>20,000</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>120,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Long-Term Debt:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonds payable</td>
<td>200,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>320,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Stockholders’ equity:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common stock, $10 par</td>
<td>760,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>270,000</td>
<td>140,000</td>
</tr>
<tr>
<td><strong>Total stockholders' equity</strong></td>
<td>1,030,000</td>
<td>740,000</td>
</tr>
<tr>
<td><strong>Total liabilities and stockholders’ equity</strong></td>
<td>$1,350,000</td>
<td>$840,000</td>
</tr>
</tbody>
</table>
Income Measurement and Profitability Analysis

Spencer Company
Condensed Income Statement
For the Year Ended December 31, 2005

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>800,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>400,000</td>
</tr>
<tr>
<td>Administrative and selling expense</td>
<td>162,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>238,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>50,500</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>187,500</td>
</tr>
<tr>
<td>Income taxes</td>
<td>37,500</td>
</tr>
<tr>
<td>Net income</td>
<td>$150,000</td>
</tr>
</tbody>
</table>

Activity Ratios
Activity ratios measure how efficiently the company manages its assets. The higher the activity ratio the less cash required to support the asset and the revenue stream.

1. Receivables Turnover
An important activity ratio that is used to analyze the liquidity of an entities accounts receivable is the “receivables turnover ratio.” This is calculated as follows:

\[
\text{Accounts Receivable Turnover} = \frac{\text{Net Sales}}{\text{Average Trade Receivables (net)}}
\]

In our example the receivables turnover ratio would be calculated as follows:

\[
\frac{\text{Net Sales}}{\text{Average Trade Receivables (net)}} = \frac{\$1,200,000}{[(230,000+150,000)/2]}
\]

\[
\frac{\text{Net Sales}}{\text{Average Trade Receivables (net)}} = \frac{\$1,200,000}{\$190,000}
\]

\[
\frac{\text{Net Sales}}{\text{Average Trade Receivables (net)}} = 6.3
\]

During 2005 Spencer Company’s accounts receivable turned over 6.3 times. A derivative of this ratio which is very useful for management purposes is the average collection period which is calculated as follows:
Income Measurement and Profitability Analysis

Average Collection Period = \frac{365}{\text{Receivables Turnover Ratio}}

In our example the average collection period for Spencer Company for the calendar year of 2005 is calculated as follows:

\begin{align*}
\frac{365 \text{ Days}}{\text{Accounts Receivable Turnover}} &= \frac{365}{6.3} \\
\frac{365 \text{ Days}}{\text{Accounts Receivable Turnover}} &= 58
\end{align*}

For Spencer Company the average accounts receivable had an outstanding balance of approximately 58 days.

2. **Inventory Turnover**

This is an important activity ratio for a merchandising company. It presents the number of times that inventory is sold during the accounting period. More inventory turns per year the less cash required to support the inventory. This ratio is calculated as follows:

\begin{align*}
\text{Inventory Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \\
\text{Cost of Goods Sold} &= \frac{800,000}{[(190,000+170,000)/2]} \\
\text{Cost of Goods Sold} &= \frac{800,000}{180,000} \\
\text{Cost of Goods Sold} &= 4.4 \\
\text{Average Inventory} &= \frac{365}{\text{Inventory Turnover Ratio}}
\end{align*}

During 2005 Spencer Company’s inventory turned over 4.4 times. A derivative of this ratio which is very useful for management purposes is the average days in inventory, which is calculated as follows:

\begin{align*}
\text{Average Days in Inventory} &= \frac{365}{\text{Inventory Turnover Ratio}}
\end{align*}
Income Measurement and Profitability Analysis

In our example the average days in inventory for Spencer Company for the calendar year of 2005 is calculated as follows:

\[
\frac{365 \text{ Days}}{\text{Inventory Turnover Ratio}} = \frac{365}{4.4}
\]

\[
\frac{365 \text{ Days}}{\text{Inventory Turnover Ratio}} = \frac{365}{83}
\]

For Spencer Company it took approximately 83 days to sell inventory during 2005.

3. Asset Turnover

The asset turnover ratio provides a measure of the efficiency of the company in utilizing all of its assets to generate revenue. The asset turnover ratio is calculated as follows:

\[
\text{Asset Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Total Assets}}
\]

In our example the asset turnover ratio would be calculated as follows:

\[
\frac{\text{Net Sales}}{\text{Average Total Assets}} = \frac{\$1,200,000}{[(840,000 + 1,350,000)/2]}
\]

\[
\frac{\text{Net Sales}}{\text{Average Total Assets}} = \frac{\$1,200,000}{\$1,095,000}
\]

\[
\frac{\text{Net Sales}}{\text{Average Total Assets}} = 1.1
\]

During 2005 Spencer Company turned over total assets 1.1 times. This is useful only in comparing the company’s asset turnover ratio with industry averages or some other benchmark. It will also be used in conjunction with the profit margin in calculating return on investment (ROA) later in this section.

Profitability Ratios

Profitability ratios measure earnings in relation to sales and resources committed to operations.

1. Profit Margin on Sales

The profit margin is the ratio of net income to net sales. It measures the percentage of every dollar of sales that is available for dividends or reinvestment. The ratio is calculated as follows:
Income Measurement and Profitability Analysis

Profit Margin on Sales = \frac{\text{Net Income}}{\text{Net Sales}}

In our example the profit margin on sales would be calculated as follows:

\[
\begin{align*}
\text{Net Income} & = 150,000 \\
\text{Net Sales} & = 1,200,000 \\
\frac{\text{Net Income}}{\text{Net Sales}} & = 12.5\%
\end{align*}
\]

For the calendar year of 2005 Spencer Company earned 12.5% profit margin on sales. For every dollar of sales the company earned .125 cents that could be used to pay dividends or reinvested in the company.

2. Return on Assets
This profitability ratio expresses net income as a ratio of the assets used to earn the income. It is calculated as follows:

\[
\text{Return on Assets} = \frac{\text{Net Income}}{\text{Average Total Assets}}
\]

In our example the return on assets would be calculated as follows:

\[
\begin{align*}
\frac{\text{Net Income}}{\text{Average Total Assets}} & = \frac{150,000}{[(840,000+1,350,000)/2]} \\
\text{Net Income} & = 150,000 \\
\text{Average Total Assets} & = 1,095,000 \\
\frac{\text{Net Income}}{\text{Average Total Assets}} & = 13.7\%
\end{align*}
\]

During 2005 the total average assets ($1,095,000) of Spencer Company generated a return of 13.7%. An alternative computation of ROA removes the net interest expense. This gives a return on assets irrespective of the form of financing. The alternative formula is calculated as follows:

\[
\text{Return on Assets} = \frac{\text{Net Income} + \text{Interest Expense (net of tax)}}{\text{Average Total Assets}}
\]

In our example the alternative computation of ROA would be as follows:
Income Measurement and Profitability Analysis

\[
\frac{\text{Net Income + Interest Expense (net of tax)}}{\text{Average Total Assets}} = \frac{150,000 + (50,500 - 10,100)}{(840,000 + 1,350,000)/2}
\]

\[
\frac{\text{Net Income + Interest Expense (net of tax)}}{\text{Average Total Assets}} = \frac{109,600}{1,095,000}
\]

\[
\frac{\text{Net Income + Interest Expense (net of tax)}}{\text{Average Total Assets}} = 10.0\%
\]

The ROA exclusive of interest expense (net of tax) is 10.0% of average total assets.

3. Return on Shareholders’ Equity

The return on shareholders’ equity provides a measure of the return to the owners of the company. The basic ratio is calculated as follows:

\[
\text{Return on Shareholders' Equity} = \frac{\text{Net Income}}{\text{Average Shareholders' Equity}}
\]

In our example the return on shareholders’ equity would be calculated as follows:

\[
\frac{\text{Net Income}}{\text{Average Shareholders' Equity}} = \frac{150,000}{(740,000 + 1,030,000)/2}
\]

\[
\frac{\text{Net Income}}{\text{Average Shareholders' Equity}} = \frac{150,000}{885,000}
\]

\[
\frac{\text{Net Income}}{\text{Average Shareholders' Equity}} = 16.9\%
\]

For 2005 Spencer Company earned 16.9% on the average equity of the company. If there are more than one class of stock the ratio may be calculated based on just the common shareholders. This topic will be discussed more fully in Intermediate Accounting II.