Using Financial Ratios: Interested Parties

- Ratio analysis involves methods of calculating and interpreting financial ratios to assess a firm’s financial condition and performance.
- It is of interest to shareholders, creditors, and the firm’s own management.

Using Financial Ratios: Types of Ratio Comparisons

- Trend or time-series analysis
  - Used to evaluate a firm’s performance over time

Using Financial Ratios: Types of Ratio Comparisons (cont.)

- Trend or time-series analysis
- Cross-sectional analysis
  - Used to compare different firms at the same point in time
Using Financial Ratios: Types of Ratio Comparisons (cont.)

- Trend or time-series analysis
- Cross-sectional analysis
  - Industry comparative analysis
    - One specific type of cross-sectional analysis. Used to compare one firm’s financial performance to the industry’s average performance

Using Financial Ratios: Types of Ratio Comparisons (cont.)

- Trend or time-series analysis
- Cross-sectional analysis
  - Benchmarking
    - A type of cross-sectional analysis in which the firm’s ratio values are compared to those of a key competitor or group of competitors that it wishes to emulate

Using Financial Ratios: Types of Ratio Comparisons (cont.)

- Trend or time-series analysis
- Cross-sectional analysis
- Combined Analysis
  - Combined analysis simply uses a combination of both time series analysis and cross-sectional analysis
Using Financial Ratios: Types of Ratio Comparisons (cont.)

**Table 2.5** Industry Average Ratios for Selected Lines of Business

<table>
<thead>
<tr>
<th>Line of Business</th>
<th>Current Ratio</th>
<th>Quick Ratio</th>
<th>Inventory Turnover</th>
<th>Total Assets Turnover</th>
<th>Return on Equity</th>
<th>Return on Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>2.0</td>
<td>1.5</td>
<td>10.5</td>
<td>2.5</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Software</td>
<td>2.2</td>
<td>1.8</td>
<td>15.2</td>
<td>3.2</td>
<td>2.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Services</td>
<td>2.0</td>
<td>1.5</td>
<td>11.5</td>
<td>3.5</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>2.1</td>
<td>1.6</td>
<td>13.1</td>
<td>3.3</td>
<td>1.3</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*Notes: The table above shows the industry average ratios. These ratios are calculated using financial data collected from a variety of companies within the same industry.*

Using Financial Ratios: Types of Ratio Comparisons (cont.)

**Figure 2.1** Combined Analysis

1. Ratios must be considered together; a single ratio by itself means relatively little.
2. Financial statements that are being compared should be dated at the same point in time.
3. Use audited financial statements when possible.
4. The financial data being compared should have been developed in the same way.
5. Be wary of inflation distortions.
Ratio Analysis Example

- We will illustrate the use of financial ratios for analyzing financial statements using the Bartlett Company Income Statements and Balance Sheets presented earlier in Tables 2.1 and 2.2.

Ratio Analysis

- Liquidity Ratios
  - Current Ratio
    \[
    \text{Current ratio} = \frac{\text{total current assets}}{\text{total current liabilities}}
    \]
    
    \[
    \text{Current ratio} = \frac{1,233,000}{620,000} = 1.97
    \]

Ratio Analysis (cont.)

- Liquidity Ratios
  - Current Ratio
  - Quick Ratio
    \[
    \text{Quick ratio} = \frac{\text{Total Current Assets - Inventory}}{\text{total current liabilities}}
    \]
    
    \[
    \text{Quick ratio} = \frac{1,233,000 - 289,000}{620,000} = 1.51
    \]
Inventory Turnover  =  Cost of Goods Sold

\[
\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}}
\]

\[
\text{Inventory Turnover} = \frac{\$2,088,000}{\$289,000} = 7.2
\]

- Liquidity Ratios
- Activity Ratios
  - Inventory Turnover

Average Age of Inventory  =  \frac{365}{\text{Inventory Turnover}}

\[
\text{Average Age of Inventory} = \frac{365}{7.2} = 50.7 \text{ days}
\]

- Liquidity Ratios
- Activity Ratios
  - Average Age of Inventory

ACP  =  \frac{\text{Accounts Receivable}}{\text{Net Sales/365}}

\[
\text{ACP} = \frac{\$503,000}{\$3,074,000/365} = 59.7 \text{ days}
\]
Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
  - Average Payment Period

\[
\text{APP} = \frac{\text{Accounts Payable}}{\text{Annual Purchases}/365} \\
\text{APP} = \frac{\$382,000}{(.70 \times \$2,088,000)/365} = 95.4 \text{ days}
\]

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
  - Total Asset Turnover

\[
\text{Total Asset Turnover} = \frac{\text{Net Sales}}{\text{Total Assets}} \\
\text{Total Asset Turnover} = \frac{\$3,074,000}{\$3,597,000} = .85
\]

Ratio Analysis (cont.)

**Table 2.6 Financial Statements Associated with Patty’s Alternatives**

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>No-debt plan</th>
<th>Total plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>$30,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Long-term liabilities</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Owners’ equity</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>$30,000</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income Statement</th>
<th>No-debt plan</th>
<th>Total plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$30,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Earnings before taxes</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Taxes</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Net income after taxes</td>
<td>$8,000</td>
<td>$8,000</td>
</tr>
<tr>
<td>Entries on equity: 12E - E</td>
<td>$7,000</td>
<td>$7,000</td>
</tr>
<tr>
<td>Entries on equity: 12E - E</td>
<td>$7,000</td>
<td>$7,000</td>
</tr>
<tr>
<td>Entries on equity: 12E - E</td>
<td>$7,000</td>
<td>$7,000</td>
</tr>
</tbody>
</table>
Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Financial Leverage Ratios
  - Debt Ratio

Debt Ratio = Total Liabilities/Total Assets

Debt Ratio = $1,643,000/$3,597,000 = 45.7%

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
  - Times Interest Earned Ratio

Times Interest Earned = EBIT/Interest

Times Interest Earned = $418,000/$93,000 = 4.5

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
  - Fixed-Payment coverage Ratio (FPCR)

FPCR = \[\frac{EBIT + \text{Lease Payments}}{\text{Interest} + \text{Lease Pymts} + (\text{Princ Pymts} + \text{PSD}) \times \frac{1}{1-t}}\]

FPCR = \[$418,000 + $35,000\]
\[\frac{\text{Interest} + \text{Lease Pymts} + (\text{Princ Pymts} + \text{PSD}) \times \frac{1}{1-t}}\]

FPCR = \$93,000 + $35,000 + (\$71,000 + $10,000) \times \frac{1}{1-0.29]

= 1.9
Ratio Analysis (cont.)

• Liquidity Ratios
• Activity Ratios
• Leverage Ratios
• Profitability Ratios
  – Common-Size Income Statements

Table 2.7
Bartlett Company
Common-Size Income Statements

<table>
<thead>
<tr>
<th>For the year ended</th>
<th>2009</th>
<th>2008</th>
<th>2009-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>14%</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>Less: Cost of goods sold</td>
<td>45%</td>
<td>46%</td>
<td>1%</td>
</tr>
<tr>
<td>Gross profit margin</td>
<td>55%</td>
<td>54%</td>
<td>1%</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>33%</td>
<td>32%</td>
<td>1%</td>
</tr>
<tr>
<td>Interest expenses</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>63%</td>
<td>64%</td>
<td>1%</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>21%</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>Net operating income</td>
<td>42%</td>
<td>43%</td>
<td>1%</td>
</tr>
<tr>
<td>Other revenues and expenses</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Net income before income taxes</td>
<td>42%</td>
<td>43%</td>
<td>1%</td>
</tr>
<tr>
<td>Less: Income taxes</td>
<td>21%</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>Net income</td>
<td>21%</td>
<td>21%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Ratio Analysis (cont.)

<table>
<thead>
<tr>
<th>GPM = Gross Profit/Net Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM = $986,000/$3,074,000 = 32.1%</td>
</tr>
</tbody>
</table>
Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
- Profitability Ratios
  - Operating Profit Margin (OPM)

\[
\text{OPM} = \frac{\text{EBIT}}{\text{Net Sales}}
\]

\[
\text{OPM} = \frac{\$418,000}{\$3,074,000} = 13.6\%
\]

---

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
- Profitability Ratios
  - Net Profit Margin (NPM)

\[
\text{NPM} = \frac{\text{Earnings Available to Common Stockholders}}{\text{Sales}}
\]

\[
\text{NPM} = \frac{\$221,000}{\$3,074,000} = 7.2\%
\]

---

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
- Profitability Ratios
  - Earnings Per Share (EPS)

\[
\text{EPS} = \frac{\text{Earnings Available to Common Stockholders}}{\text{Number of Shares Outstanding}}
\]

\[
\text{EPS} = \frac{\$221,000}{76,262} = \$2.90
\]
ROA = Earnings Available to Common Stockholders / Total Assets
ROA = $221,000 / $3,597,000 = 6.1%

ROE = Earnings Available to Common Stockholders / Total Equity
ROE = $221,000 / $1,754,000 = 12.6%

P/E = Market Price Per Share of Common Stock / Earnings Per Share
P/E = $32.25 / $2.90 = 11.1
Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
- Profitability Ratios
- Market Ratios
  - Market/Book (M/B) Ratio

\[
\text{BV/Share} = \frac{\text{Common Stock Equity}}{\text{Number of Shares of Common Stock}}
\]

\[
\text{BV/Share} = \frac{1,754,000}{72,262} = 23.00
\]

Ratio Analysis (cont.)

- Liquidity Ratios
- Activity Ratios
- Leverage Ratios
- Profitability Ratios
- Market Ratios
  - Market/Book (M/B) Ratio

\[
\text{M/B Ratio} = \frac{\text{Market Price/Share of Common Stock}}{\text{Book Value/Share of Common Stock}}
\]

\[
\text{M/B Ratio} = \frac{32.25}{23.00} = 1.40
\]

Summarizing All Ratios

**Table 2.8** Summary of Bartlett Company Ratios (2007–2009, Including 2009 Industry Averages)
DuPont System of Analysis

- The DuPont system of analysis is used to dissect the firm’s financial statements and to assess its financial condition.
- It merges the income statement and balance sheet into two summary measures of profitability.
- The Modified DuPont Formula relates the firm’s ROA to its ROE using the financial leverage multiplier (FLM), which is the ratio of total assets to common stock equity:
- ROA and ROE as shown in the series of equations on the following slide and in Figure 2.2 on the following slide.
Use of the FLM to convert ROA into ROE reflects the impact of financial leverage on the owner’s return.

Substituting the values for Bartlett Company’s ROA of 6.1 percent calculated earlier, and Bartlett’s FLM of 2.06 ($3,597,000 total assets ÷ $1,754,000 common stock equity) into the Modified DuPont formula yields:

\[ \text{ROE} = 6.1\% \times 2.06 = 12.6\% \]