CHAPTER 4
Analysis of Financial Statements

- Ratio analysis
- Du Pont equation
- Limitations of ratio analysis
- Qualitative factors

Why are ratios useful?

- Standardize numbers; facilitate comparisons
- Highlight weaknesses and strengths

Comparison Norms

- Ratios by themselves do not mean much. They take on meaning when compared to various benchmarks.
- Usually, we are concerned with how the firm has changed over time and how it compares to other "similar" firms.

Comparison Norms

- The most common comparison norms are:
  - past performance of the firm itself
  - other firms in the same industry (industry averages/medians or "target" firms)
- We often look at the trends in ratios over time (trend analysis) for clues to whether a firm's financial condition is likely to improve or to deteriorate.

Financial statements/ratios are used to:

- Try to improve performance
  - measure past performance
  - give starting point for planning
  - anticipation of future performance (What-ifs?)
- Set values (predict cashflows and determine risk)

What are the five major categories of ratios, and what questions do they answer?

- **Liquidity**: Measures the firm's ability to meet short-term obligations
- **Asset management**: Measures how effectively managers use the firm's assets (usually considers revenue generation -- sales)

- **Debt management**: Measures how much financial leverage a firm uses and the firm's ability to service its debt
- **Profitability**: Measures the "bottom-line;" shows the combined effect of the other categories
- **Market value**: Measures what investors think about the firm's performance

Liquidity Measures

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick Ratio (Acid Test)} = \frac{\text{Current assets - Inventory}}{\text{Current liabilities}}$$

Comments on CR and QR

Higher values for CR and QR mean more liquid (more current assets relative to current liabilities).

Higher values are not necessarily "better" values.

Asset Management Ratios

- **Inventory Turnover Ratio** $= \frac{\text{Sales}}{\text{Inventory}}$
- **Days Sales Outstanding (DSO)** $= \frac{\text{Receivables}}{\text{Annual Sales}/365}$
- **Fixed Assets Turnover** $= \frac{\text{Sales}}{\text{Net fixed assets}}$
- **Total Assets Turnover** $= \frac{\text{Sales}}{\text{Total Assets}}$

Comments on Asset Mgmt Ratios

- All of the turnover ratios indicate how effectively management uses assets to generate sales. (larger values are generally preferred)
- DSO indicates how quickly credit sales are converted to "cash-in-hand." (smaller values are generally preferred)

Debt Management Ratios:

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

$$\text{Times-Interest-Earned (TIE)} = \frac{\text{EBIT}}{\text{Interest Charges}}$$

$$\text{EBITDA coverage ratio} = \frac{\text{EBITDA + lease pmts}}{\text{Interest + principal + lease payments pmts}}$$

Debt management ratios measure:

1. How much debt is used.

2. The ability of the firm to meet interest payments.

How do the debt management ratios compare with industry averages?

A larger debt ratio means more leverage is being used.

A larger times interest earned ratio indicates that the firm is better able to pay the interest charges.

Interpreting debt mgmt ratios

Increased use of leverage usually increase EPS, but at the same time increases risk. Thus, the use of more or less debt can be either good or bad.

A larger times interest earned ratio is generally preferred.

Debt-to-Equity Ratio = $\frac{\text{Total Debt}}{\text{Total Equity}}$

There are other measures of the amount of debt used. They all measure the same characteristics – just in slightly different ways.

A debt ratio of 0.40 is the same as a debt-to-equity ratio of 0.6667.

A = L + E

1 = 0.4 + 0.6

DR = 0.4/1 = 0.4

D/EQ = 0.4/0.6 = 0.6667

Profitability Ratios

$$\text{Profit margin (PM)} = \frac{\text{Net Income}}{\text{Sales}}$$

$$\text{Basic earning power (BEP)} = \frac{\text{EBIT}}{\text{Total Assets}}$$

$$\text{Return on total assets (ROA)} = \frac{\text{Net Income}}{\text{Total assets}}$$

$$\text{Return on equity (ROE)} = \frac{\text{Net Income}}{\text{Common equity}}$$

Profit margin interpretation

Since profit margin ratios are indicators of "bottom-line" performance, it is true that higher values are preferred *holding all else constant*.

The problem is that to generate higher profits, you must often take on more risk. If this is true, then a higher profit value may not be *preferred*.

Market Value Ratios:

$$\text{Price/Earnings (P/E ratio)} = \frac{\text{Price/Share}}{\text{Earnings/Share}}$$

$$\text{Price/Cash flow} = \frac{\text{Price/share}}{\text{CF per share}}$$

$$\text{Market/Book ratio} = \frac{\text{Price/Share}}{\text{Book Value/Share}}$$

Market value ratios give an indication of what investors think about the firm

Since market value ratios include the current stock price, they allow you to determine what investors think about the firm's performance.

What value has been added?

The extended DuPont equation provides an overview of:

1. **Profitability measured by ROE**
2. **Expense control measured by PM**
3. **Asset utilization measured by TATO**
4. **Financial leverage measured by EM (Debt utilization) EM=1/(1-debt ratio)**
5. **The interaction between the determinants of ROE**

Extended DuPont Equation

$$\left(\begin{matrix}\text{Profit}\\ \text{margin}\end{matrix}\right)\left(\begin{matrix}\text{TA}\\ \text{turnover}\end{matrix}\right)\left(\begin{matrix}\text{Equity}\\ \text{multiplier}\end{matrix}\right) = \text{ROE}$$

$$\frac{\text{NI}}{\text{Sales}} \times \frac{\text{Sales}}{\text{TA}} \times \frac{(1)}{(1\text{-DR})} = \text{ROE}$$

Return on Assets: NOTE

$$\left(\begin{matrix}\text{Profit}\\ \text{margin}\end{matrix}\right)\left(\begin{matrix}\text{TA}\\ \text{turnover}\end{matrix}\right) = \text{ROA}$$

$$\frac{\text{NI}}{\text{Sales}} \times \frac{\text{Sales}}{\text{TA}} = \text{ROA}$$

Return on Assets: NOTE

$$\left(\text{ROA}\right)\left(\begin{matrix}\text{Equity}\\ \text{multiplier}\end{matrix}\right) = \text{ROE}$$

$$\text{ROA} \times \frac{(1)}{(1\text{-DR})} = \text{ROE}$$

Problems with ROE

- Despite its widespread use and the fact that ROE and shareholder wealth are often highly correlated, some problems can arise when firms use ROE as the sole measure of performance.
  - ROE does not consider risk.
  - ROE does not consider the amount of invested capital.

Problems with ROE

- A project's return, risk, and size combine to determine its impact on shareholder value.
- To the extent that ROE focuses only on rate of return and ignores risk and size, increasing ROE may in some cases be inconsistent with increasing shareholder wealth.
- Alternative measures of performance have been developed, including Market Value Added (MVA) and Economic Value Added (EVA).

What are some potential problems and limitations of financial ratio analysis?

- Comparison with industry averages is difficult if the firm operates many different divisions.
- "Average" performance not necessarily good.
- Seasonal factors can distort ratios.
- "Window dressing" techniques can make statements and ratios look better.

- Different operating and accounting practices distort comparisons.
- Sometimes hard to tell if a ratio is "good" or "bad."
- Difficult to tell whether company is, on balance, in strong or weak position.

What are some qualitative factors analysts should consider when evaluating a company's likely future financial performance?

- Are the company's revenues tied to 1 key customer?
- To what extent are the company's revenues tied to 1 key product?
- To what extent does the company rely on a single supplier?

(More…)

- **What percentage of the company's business is generated overseas?**
- **Competition**
- **Future prospects**
- **Legal and regulatory environment**