Chapter 3

Financial Statements Analysis

Acknowledgement

- This work is reproduced, based on the book [Ross, Westerfield, Jaffe and Jordan "Core Principles and Applications of Corporate Finance"].

- This work can be used in the financial management course with the original text book.

- This work uses the figures and tables from the original text book.

3.1 Standardizing Financial Statements

- Standardized statements make it easier to compare financial information, particularly as the company grows.

- They are also useful for comparing companies of different sizes, particularly within the same industry.

- Common-Size Balance Sheets
  - Compute all accounts as a percent of total assets

- Common-Size Income Statements
  - Compute all line items as a percent of sales

TABLE 3.1

PRUFROCK CORPORATION Balance Sheets as of December 31, 2009 and 2010 ($ in millions)		
Assets	2009	2010
Current assets		
Cash	$ 84	$ 98
Accounts receivable	165	188
Inventory	393	422
Total	$ 642	$ 708
Fixed assets		
Net plant and equipment	$ 2,731	$ 2,880
Total assets	$ 3,373	$ 3,588
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	$ 312	$ 344
Notes payable	231	196
Total	$ 543	$ 540
Long-term debt	$ 531	$ 457
Owners' equity		
Common stock and paid-in surplus	$ 500	$ 550
Retained earnings	1,799	2,041
Total	$ 2,299	$ 2,591
Total liabilities and owners' equity	$ 3,373	$ 3,588

Cited by the text book (p. 79)

TABLE 3.2

PRUFROCK CORPORATION Common-Size Balance Sheets December 31, 2009 and 2010			
Assets	2009	2010	Change
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	11.7	11.8	+ .1
Total	19.0	19.7	+ .7
Fixed assets			
Net plant and equipment	81.0	80.3	− .7
Total assets	100.0%	100.0%	.0%
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .4%
Notes payable	6.8	5.5	−1.3
Total	16.1	15.1	−1.0
Long-term debt	15.7	12.7	−3.0
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	53.3	56.9	+3.5
Total	68.2	72.2	+4.1
Total liabilities and owners' equity	100.0%	100.0%	.0%

- Current asset: +0.7%
- Fixed assets: -0.7%
- Current asset: -1.0%
- Long-term debt: -3.0%
- Equity : +4.1%

Cited by the text book (p. 80)

Income Statement

TABLE 3.4

PRUFROCK CORPORATION 2010 Income Statement ($ in millions)		
Sales		$2,311
Cost of goods sold		1,344
Depreciation		276
Earnings before interest and taxes		$ 691
Interest paid		141
Taxable income		$ 550
Taxes (34%)		187
Net income		$ 363
Dividends	$121	
Addition to retained earnings	242	

- Net income=Dividends + Addition to retained earnings

Cited by the text book (p. 81)

Common-Size Income Statement

PRUFROCK CORPORATION
Common-Size Income Statement 2010

TABLE 3.5

Sales		100.0%
Cost of goods sold		58.2
Depreciation		11.9
Earnings before interest and taxes		29.9
Interest paid		6.1
Taxable income		23.8
Taxes (34%)		8.1
Net income		15.7%
Dividends	5.2%	
Addition to retained earnings	10.5	

- Net income = Dividends + Addition to retained earnings

  (15.7%) = (5.2%) + (10.5%)

Cited by the text book (p. 81)

3.2 Ratio Analysis

- Ratios also allow for better comparison through time or between companies
  - Short-term solvency or liquidity ratios
  - Long-term solvency, or financial leverage, ratios
  - Asset management or turnover ratios
  - Profitability ratios
  - Market value ratios

Computing Liquidity Ratios

- Creditors compare a firm's current asset and current liabilities to assess whether the firm has sufficient working capital to meet its short-term needs.

- Current Ratio = Current Asset / current liabilities
  - Measure of short-term liquidity
  - A high current ratio indicates liquidity,
  - An inefficient use of cash and other short-term assets

- Quick Ratio = (Current Asset – Inventory) / Current liabilities
  - Inventory is the least liquid current asset
  - Large inventories are a sign of short-term trouble
  - Motor company

Computing Leverage Ratios

- Leverage ratios measure the firm's long-run ability to meet its obligations or its financial leverage

- Total Debt Ratio = (Total Asset – Total Equity) / Total Asset
  - The debt ratio is defined as the ratio of total debt to total assets, expressed in percentage, and can be interpreted as the proportion of a company's assets that are financed by debt
  - The higher this ratio, the more leveraged the company and the greater its financial risk. Debt ratios vary widely across industries, with capital-intensive businesses such as utilities and pipelines having much higher debt ratios than other industries like technology.

Computing Leverage Ratios

- Debt/Equity = Total Debt / Total Equity
  - The ratio of a firm's total amount of short- and long-term debt to the value of its equity, which may be calculated based on market or book values

- Equity Multiplier = Total Asset / Total Equity = 1 + Debt/Equity
  - Like all debt management ratios, the equity multiplier is a way of examining how a company uses debt to finance its assets.
  - A higher equity multiplier indicates higher financial leverage, which means the company is relying more on debt to finance its assets.

Computing Coverage Ratios

- Times Interest Earned = EBIT / Interest
  - A metric used to measure a company's ability to meet its debt obligations. It is calculated by taking a company's earnings before interest and taxes (EBIT) and dividing it by the total interest payable on bonds and other contractual debt.
  - a high ratio can indicate that a company has an undesirable lack of debt or is paying down too much debt with earnings that could be used for other projects.

- Cash Coverage = (EBIT + Depreciation) / Interest
  - A measure of a company's ability to meet its financial obligations.
  - the higher the coverage ratio, the better the ability of the enterprise to fulfill its obligations to its lenders.

Computing Inventory Ratios

- Inventory Turnover = Cost of Goods Sold / Inventory
  - A ratio showing how many times a company's inventory is sold and replaced over a period.
  - A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying.
  - High inventory levels are unhealthy because they represent an investment with a rate of return of zero.

- Days' Sales in Inventory = 365 / Inventory Turnover
  - The days in the period can then be divided by the inventory turnover formula to calculate the days it takes to sell the inventory on hand or "inventory turnover days

Computing Receivables Ratios

- Receivables Turnover = Sales / Accounts Receivable
  - measuring how efficiently a firm uses its assets.
  - A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.
  - A low ratio implies the company should re-assess its credit policies in order to ensure the timely collection of imparted credit that is not earning interest for the firm.

- Days' Sales in Receivables = 365 / Receivables Turnover
  - An expression of a firm's accounts receivable in terms of the number of days' worth of sales that the account receivable represents.

Computing Total Asset Turnover

- Total Asset Turnover = Sales / Total Assets
  - measures a firm's efficiency at using its assets in generating sales or revenue - the higher the number the better

Computing Profitability Measures

- Profit Margin = Net Income / Sales
  - how much out of every dollar of sales a company actually keeps in earnings.
  - A higher profit margin indicates a more profitable company that has better control over its costs compared to its competitors.

- Return on Assets (ROA) = Net Income / Total Assets
  - how efficient management is at using its assets to generate earnings.

- Return on Equity (ROE) = Net Income / Total Equity
  - how much profit a company generates with the money shareholders have invested.

Computing Market Value Measures

- PE Ratio = Market value per share/ Earnings per share
  - A valuation ratio of a company's current share price compared to its per-share earnings.
  - a high P/E suggests that investors are expecting higher earnings growth in the future compared to companies with a lower P/E.

- Market-to-book ratio = market value per share / book value per share
  - the value of a company by comparing the book value of a firm to its market value.
  - identify undervalued or overvalued securities by taking the book value and dividing it by market value.
  - if the ratio is above 1 then the stock is undervalued; if it is less than 1, the stock is overvalued.

TABLE 3.6
Common Financial Ratios

I. Short-Term Solvency, or Liquidity, Ratios

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

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}}$$

$$\text{Days' sales in receivables} = \frac{365 \text{ days}}{\text{Receivables turnover}}$$

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

$$\text{Capital intensity} = \frac{\text{Total assets}}{\text{Sales}}$$

II. Long-Term Solvency, or Financial Leverage, Ratios

$$\text{Total debt ratio} = \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$$

$$\text{Debt-equity ratio} = \text{Total debt/Total equity}$$

$$\text{Equity multiplier} = \text{Total assets/Total equity}$$

$$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

$$\text{Cash coverage ratio} = \frac{\text{EBITDA}}{\text{Interest}}$$

IV. Profitability Ratios

$$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

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

$$\text{Return on equity (ROE)} = \frac{\text{Net income}}{\text{Total equity}}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

III. Asset Utilization, or Turnover, Ratios

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}}$$

$$\text{Days' sales in inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}}$$

$$\text{Receivables turnover} = \frac{\text{Sales}}{\text{Accounts receivable}}$$

V. Market Value Ratios

$$\text{Price-earnings ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$\text{Market-to-book ratio} = \frac{\text{Market value per share}}{\text{Book value per share}}$$

$$\text{EV multiple} = \frac{\text{Enterprise value}}{\text{EBITDA}}$$

Cited by the text book (p. 90)

3.3 The Du Pont Identity

- The Du Pont identity decomposes return on equity (ROE) down into three parts: profit margin, total asset turnover and financial leverage.

- ROE = Net Income / Total Equity
- Multiply by 1 and then rearrange:
  - ROE = (NI / TE) (TA / TA)
  - ROE = (NI / TA) (TA / TE) = ROA * EM
- Multiply by 1 again and then rearrange:
  - ROE = (NI / TA) (TA / TE) (Sales / Sales)
  - ROE = (NI / Sales) (Sales / TA) (TA / TE)
  - ROE = PM * TAT * EM

Using the Du Pont Identity

- ROE = Profit margin * Total asset turnover * Equity multiplier
  - Profit margin is a measure of the firm's operating efficiency – how well it controls costs.
  - Total asset turnover is a measure of the firm's asset use efficiency – how well it manages its assets.
  - Equity multiplier is a measure of the firm's financial leverage.

TABLE 3.7

The Du Pont Breakdown for Yahoo! and Google

Yahoo!							
TWELVE MONTHS ENDING	ROE	=	PROFIT MARGIN	×	TOTAL ASSET TURNOVER	×	EQUITY MULTIPLIER
12/09	4.8%	=	9.3%	×	0.433	×	1.20
12/08	3.8%	=	5.9%	×	0.527	×	1.22
12/07	6.9%	=	9.5%	×	0.570	×	1.28
Google							
TWELVE MONTHS ENDING	ROE	=	PROFIT MARGIN	×	TOTAL ASSET TURNOVER	×	EQUITY MULTIPLIER
12/09	18.1%	=	27.6%	×	0.584	×	1.12
12/08	14.9%	=	19.4%	×	0.686	×	1.12
12/07	18.6%	=	25.3%	×	0.655	×	1.12

Cited by the text book (p. 93)

3.4 Using Financial Statements

- Ratios are not very helpful by themselves; they need to be compared to something.

- **Time-Trend Analysis**
  - Used to see how the firm's performance is changing through time

- **Peer Group Analysis**
  - Compare to similar companies or within industries
  - SIC and NAICS codes

Potential Problems

- No underlying theory
- Diversified firms and conglomerate.
- Differences in accounting regulations.
- Varying accounting procedures.
- Different fiscal years.
- Extraordinary, or one-time, events

References

- Ross, Westerfield, Jaffe and Jordan, Core Principles and Application of Corporate Finance, 3ed, McGraw Hill.

- Jordan, Miller, and Dolvin, Fundamentals of Investments, 6ed, MacGraw Hill.

- Berk, DeMarzo and Harford, Fundamentals of Corporate Fiance, 2nd ed, Pearson.