Ch02: Financial statements and analysis

- Analysis of financial statements is based on the knowledge and use of *ratios*, or *relative values*, not *absolute values*.
- Absolute values are often *less* meaningful than relative values in relating information, e.g., GDP is less meaningful than GDP *per capita*, the total 100 medals won by China with its 1.3b population in the 2008 Olympics is less meaningful than 1 medal per 245,000 of Jamaica's 2.7m population, 1 medal per 465,000 people of Australia's 27m population, and 1 medal per 470,000 people of Cuba's 11.3m population.

• Ratio analysis calculates and interprets financial ratios to assess a firm's performance and status by using info from balance sheet and income statement.

• Interested parties of ratio analysis include present and prospective *shareholders*, *creditors* and the *firm's mgt*.

• Students are required to be able to calculate as well as to (perhaps more important) *interpret* the various ratios.

• Three types of ratio comparisons can be made:

cross-sectional;

time-series, aka *intertemporal* and;

combined analysis.

• *Cross-sectional* analysis involves comparing different firms' fin. ratios at the same point in time. Benchmark comparison can be based on industry leader, and/or industry average.

• The U.S. government uses the *Standard Industrial Classification (SIC)* code to classify firms into the various industries.

- • Firms with same SIC codes may be assumed to be similar.
- • SIC codes are 4-digit codes established by the U.S. government for statistical reporting purposes.
- • The first digit in the SIC code establishes the general type of business.
- • Each additional digit narrows down the industry.
- • Selected 2-digit SIC codes follow:

Agriculture, forestry and fishing
01 agriculture production - crops
08 forestry
09 fishing, hunting and trapping

Wholesale trade
50 wholesale trade - durable goods
51 wholesale trade - nondurable goods

Mining
10 metal mining
12 bituminous coal, and lignite mining
13 oil and gas extraction

Retail trade
54 food stores
55 automobile dealers and gas stations
58 eating and drinking places

Construction
15 building and construction
16 construction and other than building
17 construction - special trade contractors

Finance, insurance and real estate
60 banking
63 insurance
65 real estate

Manufacturing
28 chemicals and allied products
29 petroleum refining and related industries
35 machinery, except electrical
37 transportation equipment

Services
78 motion pictures
80 health services
82 educational services

Transportation, communication, electric, gas and sanitary service
40 railroad transportation
45 transportation by air
49 electric, gas and sanitary services

• Some examples of 4-digit SIC codes

Dell	3571	Best Buy	5731	GM	3711
IBM	3571	Merrill Lynch	6211	Daimler-Chrysler	3711
Citibank	6021	Charles Schwab	6211	Honda	3711
CBNA	6021	JNJ	2834	Microsoft	7372
Wal-Mart	5331	Pfizer	2834	Oracle	7372
Home Depot	5211	Merck	2834	Intel	3674
GE	3699	CVS Caremark	5912	Yahoo	7373

• Industry averages can readily be found in Almanac of Business & Industrial Fin. Ratios, Dun & Bradstreet's Key Business Ratios, Business Month, FTC Quarterly Reports, Robert Morris Associates Statement Studies.
• Multi-product firms' (e.g., General Electric with its aerospace, broadcasting, light bulbs, etc.) fin. ratios have to be interpreted with special care.
• Comparison of a particular ratio to the standard is made to isolate any deviations from the norm.

Example: Current ratio is defined as CA/CL. Firms A and B are in the same industry. A's current ratio is 2.5, B's is 1.55, and the industry average is 1.50.
Even though current ratio is a liquidity measure, and liquidity is in general a desirable phenomenon, we cannot jump to the conclusion that since A's ratio deviates more favorably from the norm, it's better off than B. The contrary may well be true, i.e., A may not be managing its net working capital efficiently.

• Significant deviations from either side of the industry average deserve further investigation.
• Large deviations from the norm only reflect symptoms of a problem. Large deviations are not to be confused as cause(s) of a problem.

Example: Using the earlier example, A's higher liquidity than B's or the industry's could be as a result of A's lenient trade credit policy which translates into high account receivable. The extremely high acct receivable may be a cause of a problem when comes collection time.

• Ratio analysis only directs the analyst to potential areas of concern.
• Ratio analysis does not provide conclusive evidence as to the existence of a problem.
• Further discussions with key mgrs are required to identify and isolate the cause of a problem.
• Last but not least, make reasonable comparison. If you're only a family-owned burger stall, do you want to compare yourself to numbers from McDonald's?
• Time-series ratio analysis involves evaluations of the firm's fin. performance over time.

Combined analysis ≡ combining time-series and cross-sectional analysis.
Discuss Figure 2.1, p. 51, on combined analysis

Cautions in performing ratio analysis:
1. One ratio is insufficient to judge a firm's overall performance. A group of ratios is preferred. One or two ratios may be sufficient only when specific aspect of a firm is studied.
2. Fin. statements where the data originate should be dated at the same time during a year. E.g., inventory level in June ≠ inventory level in December for a toy store.
3. Audited financial statements are preferred to un-audited ones.
4. Fin. data being compared should have been developed in the same way.
5. Don't forget to incorporate inflationary effects, esp for time-series data.

Four groups of financial ratios:

I	liquidity ratios	measures risk	S/T measures
ii	activity ratios	--ditto--	S/T measures
iii	debt ratios	--ditto--	L/T measures
iv	profitability ratios	measures return	S/T measures

Liquidity Ratios

In general, liquidity is defined in finance as:
Liquidity ≡ the ease with which a non-cash asset can be converted into cash without significant loss in value. E.g., a $200k CD is more liquid than a house.
In the accounting context:
Liquid ≡ a state in which CA > CL.
Solvent ≡ a state in which TA > TL.
Strictly speaking, liquidity ≠ solvency.
Liquidity ratios indicate a firm's ability to satisfy its short-term obligations as they come due.

1. $NWC = CA - CL$

2. $Current\ Ratio = \dfrac{CA}{CL}$

3. $Quick\ ("acid\ test")\ Ratio = \dfrac{CA - Inventory}{CL}$

4. $Cash\ Ratio = \dfrac{CASH}{CL}$

Activity ratios

Activity ratios measure the speed with which the various accounts are converted into sales or cash.

$$1.\ Inventory\ T/O = \frac{COGS}{Inventory}$$

$$2.\ Avg\ age\ of\ Inventory = \frac{365}{Inventory\ T/O}$$

$$3.\ Avg\ collection\ period = \frac{acct\ receivables}{avg\ sales\ per\ day} = \frac{acct\ receivables}{\frac{annual\ sales}{365}}$$

$$4.\ avg\ payment\ period = \frac{acct\ payable}{avg\ purchase\ per\ day} = \frac{acct\ payable}{\frac{annual\ purchase}{365}}$$

$$5.\ Fixed\ Asset\ T/O = \frac{sales}{net\ fixed\ assets}$$

$$6.\ Total\ Asset\ T/O = \frac{sales}{total\ assets}$$

Debt Ratios

$$1.\ Debt\ Ratio = \frac{total\ liability}{total\ assets}$$

$$2.\ time\ int\ est\ earned = \frac{EBIT}{int\ est}$$

$$3.\ \frac{EBIT + lease\ payment}{int\ est + lease\ payment + [(principal + preferred\ stk\ dividends)(\frac{1}{1-T})]}$$

where T = avg. corporate tax rate applicable to the firm's income.

Profitability Ratios

$$Gross\ profit\ margin = \frac{sales - COGS}{sales}$$

$$Net\ profit\ margin = \frac{net\ income}{sales}$$

$$Return\ on\ asset = \frac{net\ income}{total\ assets}$$

$$Return\ on\ equity = \frac{net\ income}{equity}$$

$$eqs = \frac{earnings\ available\ to\ common\ stkholders}{\#\ shares\ of\ equity\ outstanding}$$

$$P/E\ ratio = \frac{mkt\ price\ per\ share\ of\ equity}{eps}$$

Complete ratio analysis comes in 2 forms:
(I) the duPont system of analysis, and;
(II) summary analysis of a large number of ratios.

The duPont system of analysis is a schematic exposition of a firm's income statement and balance sheet in an attempt to assess its financial conditions.
The final outcome of the duPont system of analysis is the ROE which is the product of ROA and the financial leverage multiplier which in turn is the ratio of total assets to equity. Three areas of concern addressed explicitly by the duPont system are: (1) profits on sale; (2) efficiency of asset used, and; (3) fin. leverage use. (1)&(2) represent return whereas (3) represents risk.
The duPont system is used as a search technique to identify fin. performing or non-performing area,

The many-ratio summary analysis gives all aspects of the firm's activities.
duPont system of analysis, p. 69, Figure 2.2

Economic value added, EVA

$\boxed{EVA = EBIT(1 - T) - WACC*(\text{invested capital})}$, where

T = marginal tax rate
WACC = weighted average cost of capital (to be discussed in Ch10)
Invested capital = L-T debt, stockholder equity + retained earnings

- EVA is closely related to NPV. While NPV uses discounting to determine if a project is worth pursuing, EVA is like the NPV of the entire firm for the <u>current</u> period, and thus no discounting is needed.
- A positive EVA implies the firm earns more than what its capital costs.
- Many firms use EVA to determine employee compensation and bonuses: higher EVA means higher pay.