Return on Invested Capital and Profitability Analysis

8

CHAPTER
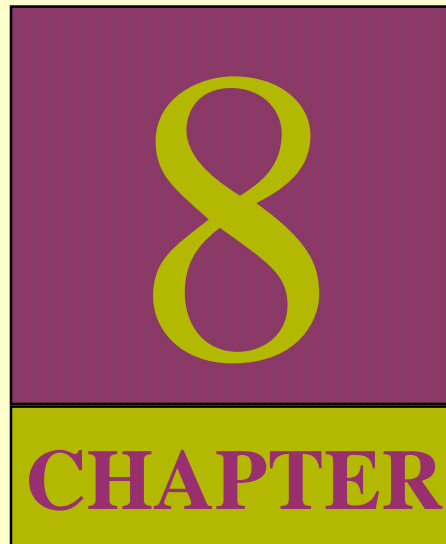
Return on Invested Capital

- **Joint analysis is where one measure is assessed relative to another**

- **Return on invested capital (ROIC) is an important joint analysis**
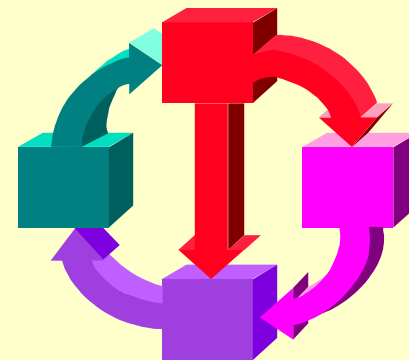
Return on Invested Capital

ROI Relation

- ROI relates income, or other performance measure, to a company's level and source of financing

- ROI allows comparisons with alternative investment opportunities

- Riskier investments are expected to yield a higher ROI

- ROI impacts a company's ability to succeed, attract financing, repay creditors,and reward owners

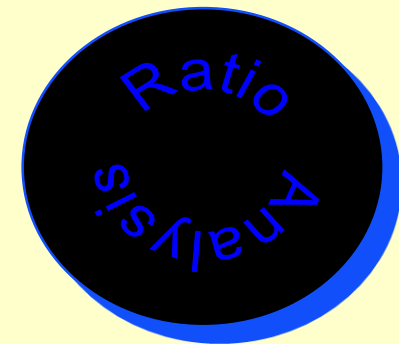Ratio Analysis
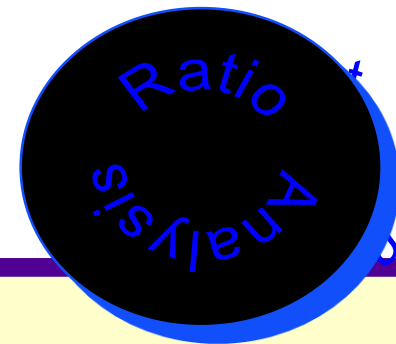
Return on Invested Capital

Application of ROI

ROI is applicable to:

(1) measuring managerial effective-ness	(2) measuring profitability	(3) Measure for planning and control

(3) earnings forecasting

Ratio Analysis

Return on Invested Capital

- **Management is responsible for all company activities**

- **ROI is a measure of managerial effectiveness in business activities**

- **ROI depends on the skill, resourcefulness, ingenuity, and motivation of management**

Return on Invested Capital

- **ROI is an indicator of company profitability**

- **ROI relates key summary measures: profits with financing**

- **ROI conveys return on invested capital from different financing perspectives**

Return on Invested Capital

Measurement for Planning and Control

ROI assists managers with:

- **Planning**
- **Budgeting**
- **Coordinating activities**
- **Evaluating opportunities**
- **Control**

Components of ROI

Return on invested capital is defined as:

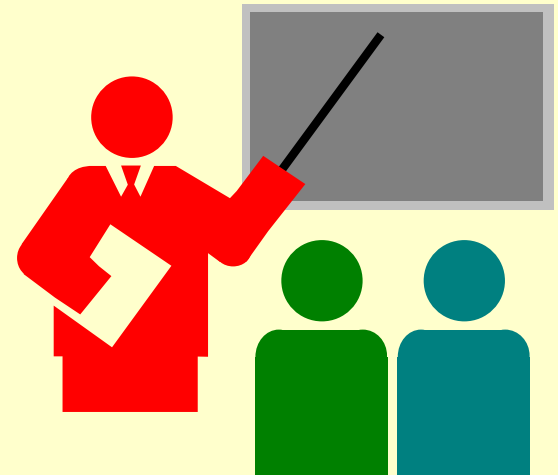$$\frac{\text{Income}}{\text{Invested capital}}$$

Ratio Analysis

Components of ROI

Invested Capital Defined

- **No universal measure of invested capital exists**

- **Different measures of invested capital reflect different financiers' perspectives**

Components of ROI

Common Measures:
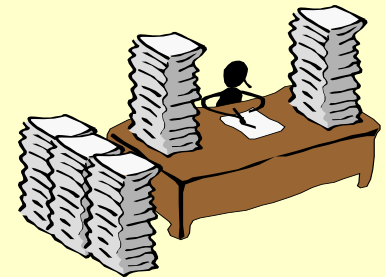- **Net Operating Assets**
- **Stockholders' Equity**

Ratio Analysis

Components of ROI

- **Perspective is that of the company as a whole**
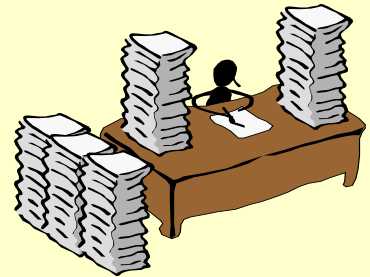- **Called return on net operating assets (RNOA)**

RNOA:
- ◆ **measures operating efficiency/ performance**
- ◆ **reflects return on net operating assets (excluding financial assets/liabilities)**

Components of ROI

1. Net Operating Working Capital (excluding S-T investments and borrowings)

2. L-T Operating assets less L-T operating Liabilities

Components of ROI

Common Equity Capital

- **Perspective is that of common equity holders**

- **Captures the effect of leverage (debt) capital on equity holder return**

- **Excludes all debt financing and preferred equity**

Components of ROI

Computing Invested Capital

- Usually computed using **average** capital available for the period
- Typically add beginning and ending invested capital amounts and divide by 2
- More accurate computation is to average interim amounts — quarterly or monthly

Components of ROI

Income Defined

- Definition of **income (return)** depends on definition of **invested capital**
- Measures of income in computing return on invested capital must reflect all applicable expenses from the perspective of the capital contributors
- Income taxes are valid deductions in computing income for return on invested capital

Examples:
- Return on net operating assets capital uses net operating profit after tax (NOPAT)
- Return on common equity capital uses net income less preferred dividends (not an expense in computing net income)

Components of ROI

- ➢ **Many accounting numbers require analytical adjustment—see prior chapters**
- ➢ **Some numbers not reported in financial statements need to be included**
- ➢ **Such adjustments are necessary for effective analysis of return on invested capital**

Components of ROI

$$\frac{\text{NOPAT}}{(\text{Beginning NOA} + \text{Ending NOA}) \div 2}$$

Where

- **NOPAT = Operating income x (1- tax rate)**

- **NOA   = net operating assets**

Components of ROI

$$\frac{\text{Net Income - Preferred Dividends}}{(\text{Beginning Equity} + \text{Ending Equity}) \div 2}$$

Where

- **Equity is stockholders' equity less preferred stock**

Analyzing Return on Assets--ROA

Disaggregating RNOA

**Return on operating assets =
Operating Profit margin x Operating Asset turnover**

$$\frac{\text{NOPAT}}{\text{Avg. NOA}} = \frac{\text{NOPAT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Avg. NOA}}$$

Operating Profit margin: measures operating profitability
relative to sales
Operating Asset turnover (utilization): measures effectiveness
in generating sales from operating assets

Effect of Operating Leverage on RNOA

$$RNOA = \frac{NOPAT}{Sales} \times \frac{Sales}{Average\ OA} \times (1 + OLLEV)$$
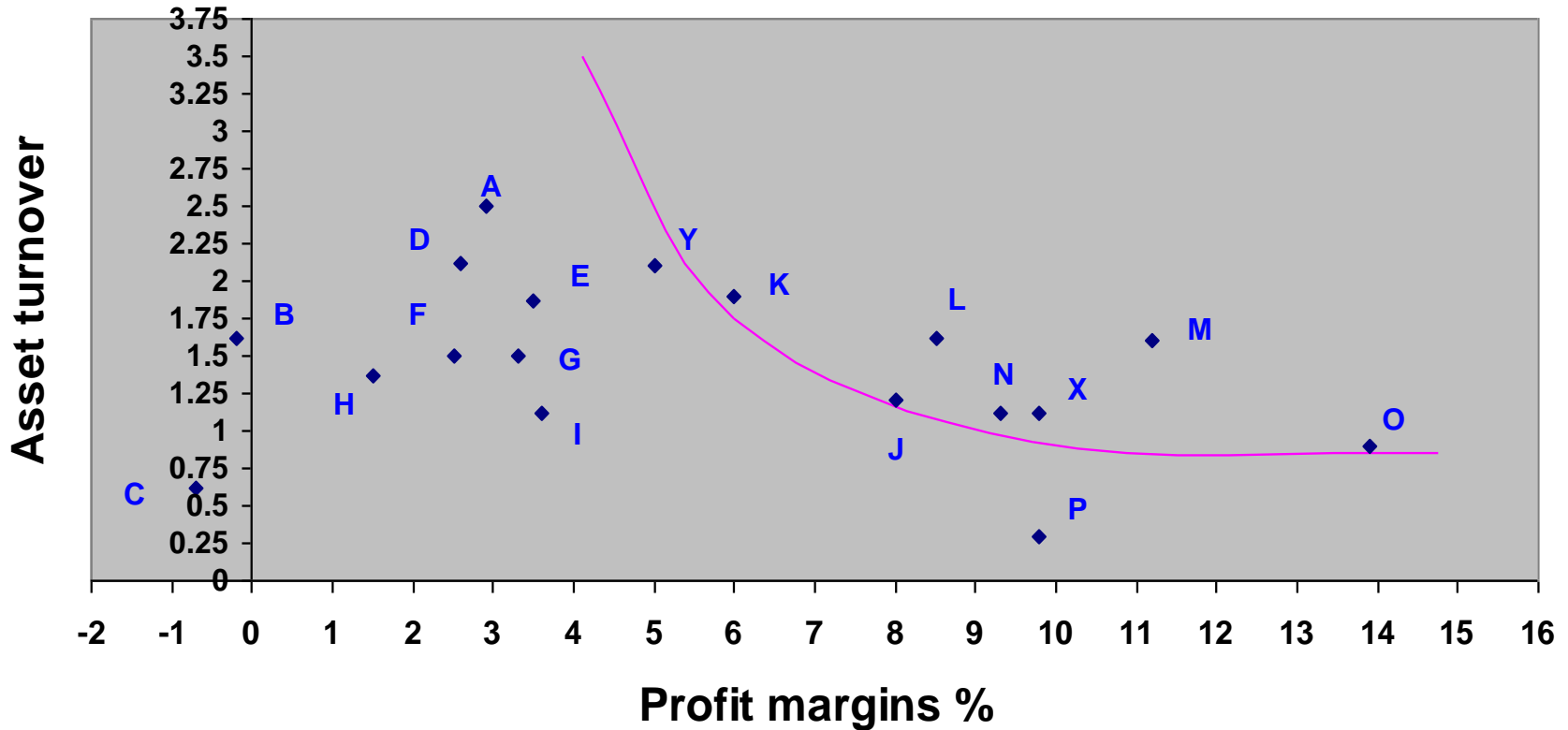
OA = operating assets

OLLEV = operating liabilities leverage ratio
(operating liabilities / NOA)

Analyzing Return on Assets--ROA

Relation Between Profit Margin and Asset Turnover

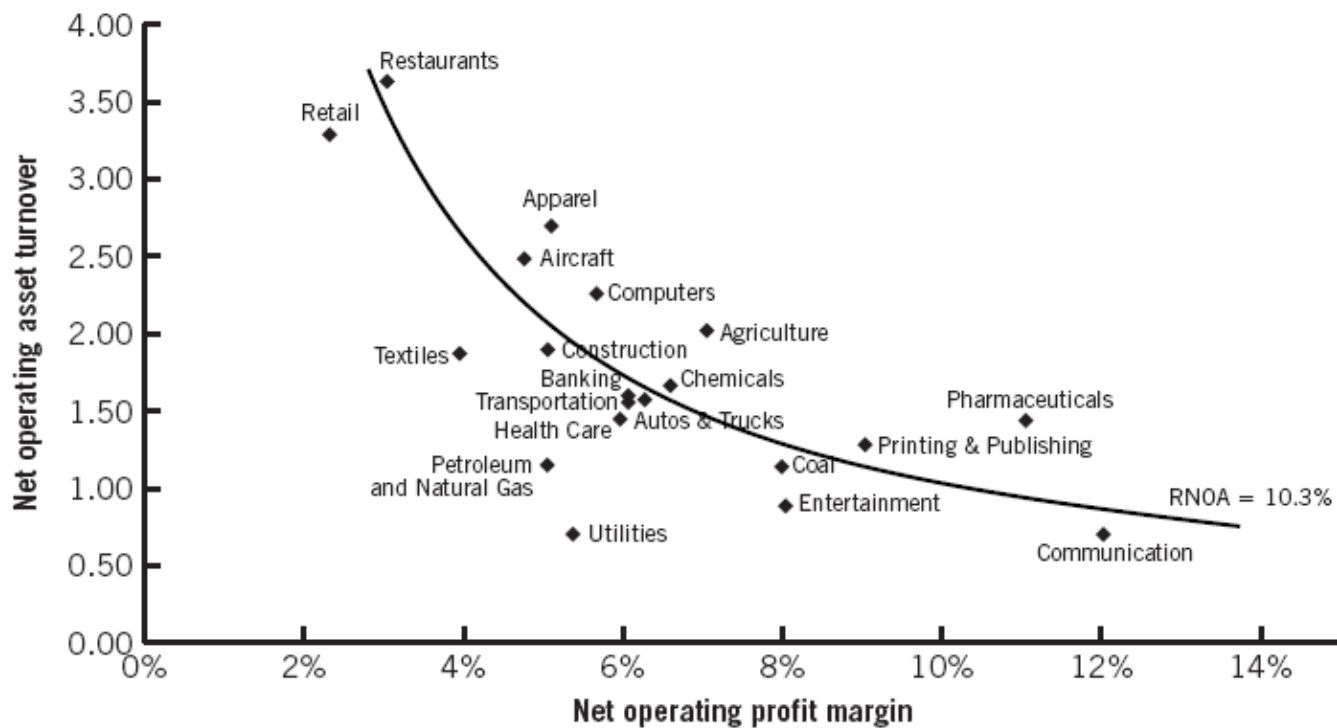Profit margin and asset turnover are **interdependent**

Relation between Profit Margin, Asset Turnover, and Return on Assets

Net operating Asset Turnover vs. Net operating Profit Margin for Selected Industries
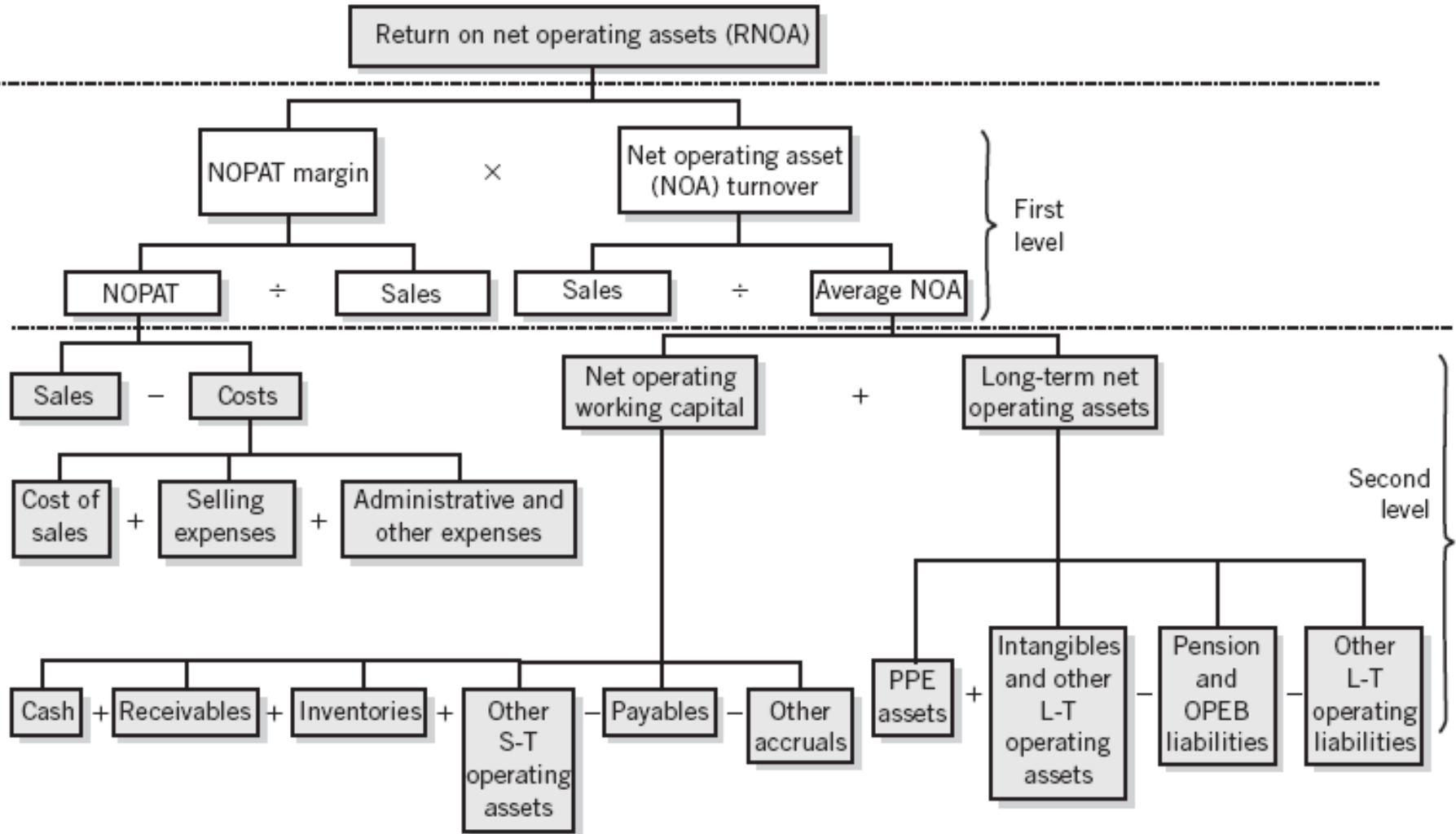

Exhibit 8.6

Net Operating Asset Turnover and Net Operating Profit Combinations for a Given RNOA

Analyzing Return on Assets--ROA

Disaggregating Return on Net Operating Assets   *Exhibit 8.3*
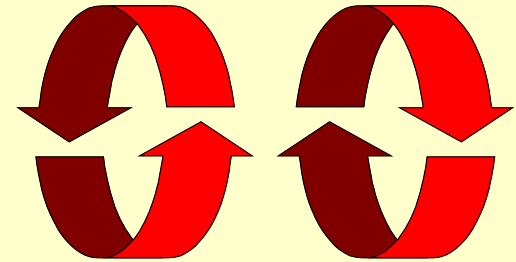
Analyzing Return on Assets--ROA

Disaggregating Profit Margin

Gross Profit Margin: Reflects the gross profit as a percent of sales
- Reflects the company's ability to increase or maintain selling price
- Declining gross profit margins generally indicate that competition has increased or that the company's products have become less competitive, or both.

Operating Expense Margin: Measures the company's ability to control operating expenses
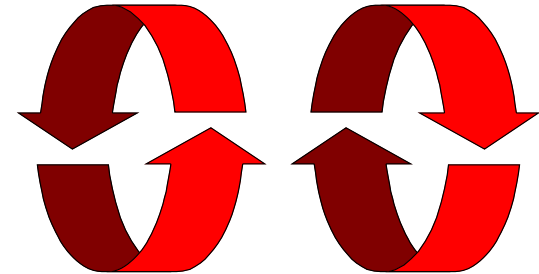- need to be aware of "investment" costs, like advertising and R&D. Reductions can lead to a short-term gain at a long-term cost.

Analyzing Return on Assets--ROA

Asset Turnover Analysis

- **Asset turnover measures the intensity with which companies utilize assets**

- **Relevant measure is the amount of sales generated**

Analyzing Return on Assets--ROA

Disaggregating Asset turnover

Accounts Receivable turnover: Reflects how many times receivables are collected on average. The accompanying ratio is the **average collection period**.

Inventories turnover: Reflects how many times inventories are collected on average. The accompanying ratio is the **average inventory days outstanding**.

Long-term Operating Asset turnover: Reflects the productivity of long-term operating assets.

Accounts Payable turnover: Reflects how quickly accounts payable are paid, on average. The accompanying ratio is the **average payable days outstanding**.
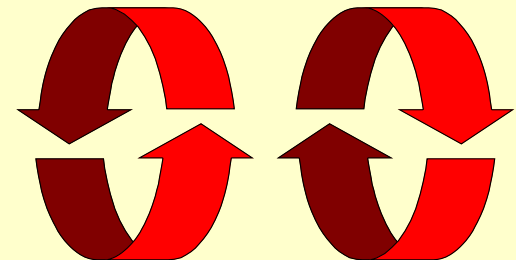
Analyzing Return on Common Equity--ROCE

$$V_t = BV_t + \frac{NI_{t+1} - (k \times BV_t)}{(1 + k)} + \frac{NI_{t+2} - (k \times BV_{t+1})}{(1 + k)^2} + \cdots$$

This can be restated in terms of future ROCE:

$$V_t = BV_t + \frac{(ROCE_{t+1} - k)BV_t}{(1 + k)} + \frac{(ROCE_{t+2} - k)BV_{t+1}}{(1 + k)^2} + \cdots$$

where ROCE is equal to net income available to common shareholders (after preferred dividends) divided by the beginning-of-period common equity

Analyzing Return on Common Equity--ROCE

$$ROCE = RNOA + (LEV \times Spread)$$

Term	Definition
LEV (financial leverage)	Average NFO/Average equity
NFO (net financial obligations)	Interest-bearing liabilities less marketable securities and other nonoperating assets (or NOA − Equity)
Spread...	RNOA–NFR
NFR(net financial rate).....................................	NFE/Average NFO
NFE (net financial expense).............................	Interest expense less investment returns from nonoperating assets

Analyzing Return on Common Equity--ROA

- **Leverage refers to the extent of invested capital from other than common shareholders**

- **If suppliers of capital (other than common shareholders) receive less than ROA, then common shareholders benefit; the reverse occurs when suppliers of capital receive more than ROA**

- **The larger the difference in returns between common equity and other capital suppliers, the more successful (or unsuccessful) is the trading on the equity**

Analyzing Return on Common Equity--ROCE

Alternate View of ROCE Disaggregation

An alternate view of the ROCE disaggregation is provided by the following equivalent equation:

$$\textbf{ROCE} = \textbf{Adjusted profit margin} \times \textbf{Asset turnover} \times \textbf{Leverage}$$

$$\frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common equity}} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average assets}} \times \frac{\text{Average assets}}{\text{Average common equity}}$$

Analyzing Return on Common Equity--ROCE

Assessing Equity Growth

$$\text{Equity growth rate} = \frac{\text{Net income} - \text{Preferred dividends} - \text{Dividend payout}}{\text{Average common stockholders' equity}}$$

- **Assumes earnings retention *and* a constant dividend payout**

- **Assesses common equity growth rate through earnings retention**

Analyzing Return on Common Equity--ROCE

Assessing Equity Growth

$$\text{Sustainable equity growth rate} = \text{ROCE} \times (1 - \text{Payout rate})$$

Assumes internal growth depends on *both* earnings retention and return earned on the earnings retained