

1076.92	107.88	71.62	67.46
3230.76	323.64	214.86	202.40
923.08	146.35	61.38	63.42
2769.24	439.11	184.14	190.28

10e Financial Statement  
ANALYSIS

K. R. SUBRAMANYAM  
JOHN J. WILD

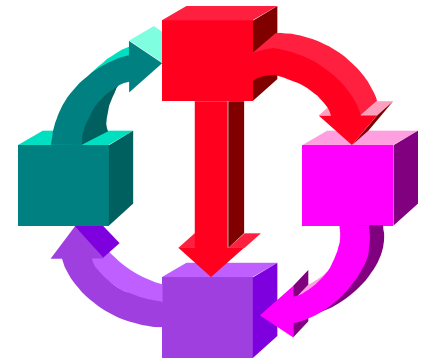
# Financial Statement Analysis

*K R Subramanyam  
John J Wild*

# Return on Invested Capital

## Importance of Joint Analysis

- **Joint analysis is where one measure is assessed relative to another**
- **Return on invested capital (ROIC) or Return on Investment (ROI) is an important joint analysis**



# Return on Invested Capital

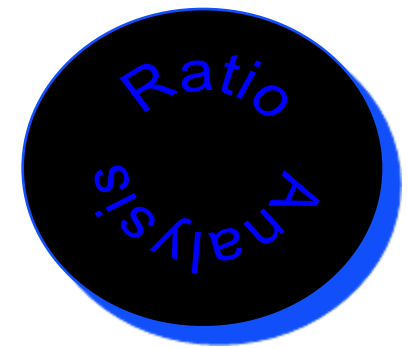
## Application of ROI

ROI is applicable to:

(1)  
measuring  
managerial  
effectiveness

(2)  
measuring  
Profitability

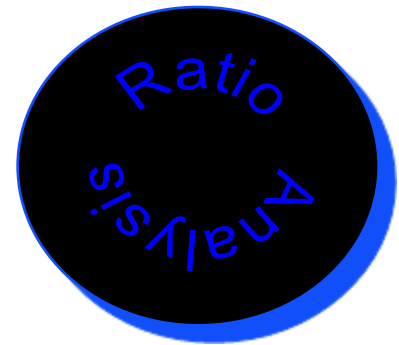
(3)  
measure for  
planning and  
control



# Components of ROI

- Return on invested capital is defined as:

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



# Components of ROI

## Alternative Measures of Invested Capital

### Common Measures:

- Net Operating Assets
- Stockholders' Equity



# Components of ROI

## Net Operating Assets

- 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

## 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

$$\frac{\text{net income less preferred dividends}}{\text{average common equity}}$$



# Components of ROI

## Adjustments to Invested Capital and Income Numbers

- 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

Return on Net Operating Assets -- RNOA

**NOPAT**

**$(\text{Beginning NOA} + \text{Ending NOA}) / 2$**

**Where**

- **NOPAT = Operating income x (1- tax rate)**
- **NOA = net operating assets**

# Components of ROI

## Operating and nonoperating activities - Distinction

<b>BALANCE SHEET</b>	
Operating assets ..... OA	Financial liabilities ..... FL
Less operating liabilities ..... (OL)	Less financial assets ..... <u>(FA)</u>
	Net financial obligations..... NFO
	Stockholders' equity..... SE
Net operating assets..... <u>NOA</u>	Net financing ..... <u>NFO + SE</u>

# Components of ROI

Return on Common Equity -- ROCE

$$\frac{\text{Net income} - \text{Preferred dividends}}{(\text{Beginning equity} + \text{Ending equity}) / 2}$$

**Where**

- **Equity is stockholder's 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

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

**OA** = operating assets

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

# Profit Margin and Asset Turnover

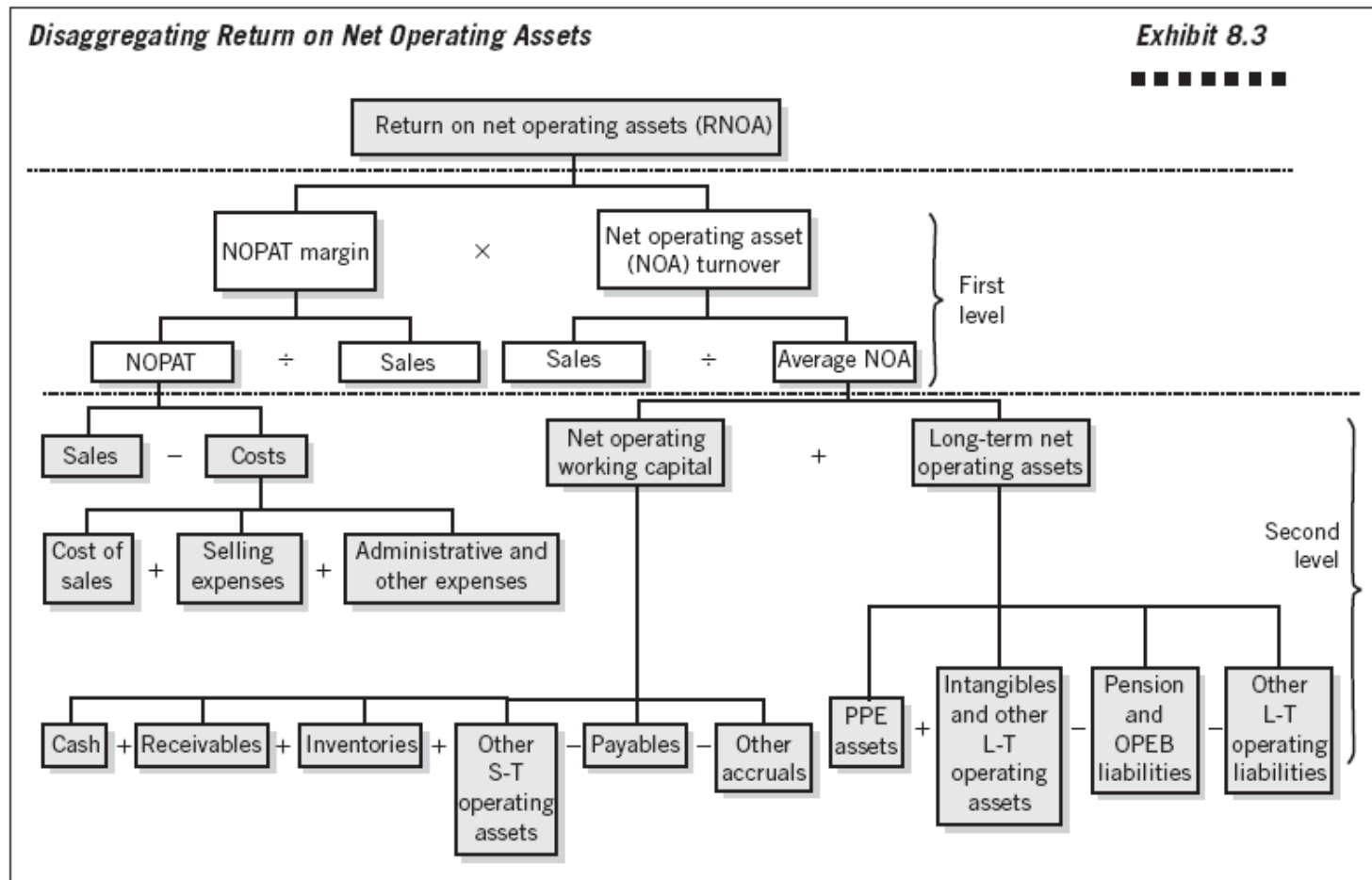
- **Profit margin and asset turnover are interdependent**
  - Profit margin is a function of sales and operating expenses
    - (selling price x units sold)
  - Turnover is also a function of sales
    - (sales/assets)

<b>Analysis of Return on Net Operating Assets</b>			
Sales	\$5,000,000	\$10,000,000	\$10,000,000
NOPAT	\$500,000	\$500,000	\$100,000
NOA	\$5,000,000	\$5,000,000	\$1,000,000
NOPAT margin	10%	5%	1%
NOA turnover	1	2	10
Return on net operating assets	10%	10%	10%

# Analyzing Return on Assets-ROA

*Disaggregating Return on Net Operating Assets*

*Exhibit 8.3*



# Analyzing Return on Assets-ROA

## Disaggregating Profit Margin

$$\text{Operating profit margin (OPM)} = \frac{\text{NOPAT}}{\text{Sales}}$$

$$\text{Pretax PM} = \text{Pretax sales PM} + \text{Pretax other PM}$$

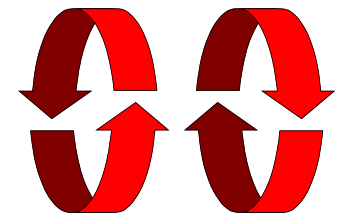
$$\text{Pretax sales PM} = \frac{\text{Gross margin}}{\text{Sales}} - \frac{\text{Selling expense}}{\text{Sales}} - \frac{\text{Administration expense}}{\text{Sales}} - \frac{\text{R\&D}}{\text{Sales}}$$

$$\text{Pretax other PM} = \frac{\text{Equity income}}{\text{Sales}} + \frac{\text{Special items}}{\text{Sales}} + \dots$$

# Analyzing Return on Assets-ROA

## Disaggregating Profit Margin

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

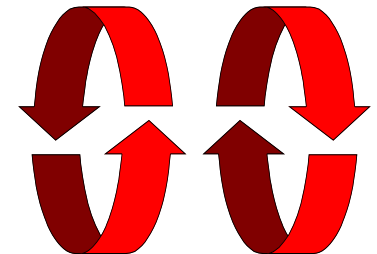


# Analyzing Return on Assets-ROA

## Disaggregation of Asset Turnover

- **Asset turnover measures the intensity with which companies utilize assets**
- **Relevant measure is the amount of sales generated**

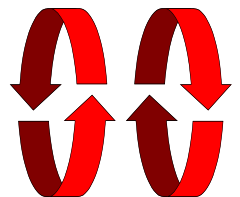
$$\frac{\text{Sales}}{\text{average net operating assets}}$$



# Analyzing Return on Assets-ROA

## Disaggregation of Asset Turnover

- **Accounts Receivable turnover:** Reflects how many times receivables are collected on average.
  - Accompanying ratio: Average collection period
- **Inventories turnover:** Reflects how many times inventories are collected on average
  - Accompanying ratio: 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
  - Accompanying ratio: Average payable days outstanding



# Analyzing Return on Assets-ROA

## Disaggregation of Asset Turnover

**Accounts receivable turnover = Sales/Average accounts receivable**

**Average collection period = Accounts receivable/Average daily sales**

**Inventory turnover = Cost of goods sold/Average inventory**

**Average inventory days outstanding = Inventory/Average daily cost of goods sold**

**Long-term operating asset turnover = Sales/Average long-term operating assets**

**Accounts payable turnover = Cost of goods sold/Average accounts payable**

**Average payable days outstanding = Accounts payable/Average daily cost of goods sold**

**Net operating working capital turnover = Net sales/Average net operating working capital**

# Analyzing Return on Common Equity-ROCE

## Role in Equity Valuation

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

This can be restated in terms of **future ROCE**:

$$V_t = BV_t + \frac{(\text{ROCE}_{t+1} - k)BV_t}{(1 + k)} + \frac{(\text{ROCE}_{t+2} - k)BV_{t+1}}{(1 + k)^2} + \dots$$

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

## Disaggregating ROCE

$$\text{ROCE} = \text{RNOA} + (\text{LEV} \times \text{Spread})$$

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-ROCE

## Leverage and ROCE

- **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:

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

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

# 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

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

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



# P8-2 & P8-3