Return on Invested Capital and Profitability Analysis

CHAPTER 8
Return on Invested Capital

Importance of Joint Analysis

- 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.
Return on Invested Capital

Application of ROI

ROI is applicable to:

(1) measuring managerial effectiveness

(2) measuring profitability

(3) Measure for planning and control

(3) earnings forecasting
Return on Invested Capital

Measuring Managerial Effectiveness

- 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

Measuring Profitability

- 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
Return on invested capital is defined as:

\[
\frac{\text{Income}}{\text{Invested capital}}
\]
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

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

Net Operating Assets

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

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

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

Where

- \(\text{NOPAT} = \text{Operating income} \times (1 - \text{tax rate})\)
- \(\text{NOA} = \text{net operating assets}\)
Components of ROI

Return on Common Equity -- ROCE

\[
\text{ROCE} = \frac{\text{Net Income} - \text{Preferred Dividends}}{(\text{Beginning Equity} + \text{Ending Equity}) / 2}
\]

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

- Restaurants
- Retail
- Apparel
- Aircraft
- Computers
- Agriculture
- Construction
- Chemicals
- Transportation
- Autos & Trucks
- Health Care
- Pharmaceuticals
- Printing & Publishing
- Entertainment
- Communication
- Utilities
- Coal
- Petroleum and Natural Gas
- Banking
- RNOA = 10.3%
Analyzing Return on Assets—ROA

Disaggregating Return on Net Operating Assets

Return on net operating assets (RNOA)

\[ \text{NOPAT margin} \times \text{Net operating asset (NOA) turnover} \]

First level

NOPAT \( \div \) Sales \( \div \) Average NOA

\[ \frac{\text{Sales} - \text{Costs}}{\text{Cost of sales} + \text{Selling expenses} + \text{Administrative and other expenses}} \]

Second level

Net operating working capital + Long-term net operating assets

\[ \text{Cash} + \text{Receivables} + \text{Inventories} + \text{Other S-T operating assets} - \text{Payables} - \text{Other accruals} + \text{PPE assets} + \text{Intangibles and other L-T operating assets} - \text{Pension and OPEB liabilities} - \text{Other L-T operating liabilities} \]
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.
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

**Role in Equity Valuation**

\[
V_t = BV_t + \frac{NI_{t+1} - (k \times BV_t)}{(1 + k)} + \frac{NI_{t+2} - (k \times BV_{t+1})}{(1 + k)^2} + \ldots
\]

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

\[
V_t = BV_t + \frac{(ROCE_{t+1} - k)BV_t}{(1 + k)} + \frac{(ROCE_{t+2} - k)BV_{t+1}}{(1 + k)^2} + \ldots
\]

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

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>LEV (financial leverage)</td>
<td>Average NFO/Average equity</td>
</tr>
<tr>
<td>NFO (net financial obligations)</td>
<td>Interest-bearing liabilities less marketable securities and other nonoperating assets (or NOA – Equity)</td>
</tr>
<tr>
<td>Spread</td>
<td>RNOA–NFR</td>
</tr>
<tr>
<td>NFR (net financial rate)</td>
<td>NFE/Average NFO</td>
</tr>
<tr>
<td>NFE (net financial expense)</td>
<td>Interest expense less investment returns from nonoperating assets</td>
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</tbody>
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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.
An alternate view of the ROCE disaggregation is provided by the following equivalent equation:

\[
\text{ROCE} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common equity}} \times \frac{\text{Net income} - \text{Preferred dividends}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average assets}} \times \frac{\text{Average assets}}{\text{Average common equity}}
\]
Analyzing Return on Common Equity--ROCE

Assessing Equity Growth

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 - \text{Payout rate})

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