

Limitations of Ratio Analysis

Not Cash Flows or Market Values

Most involve only income statement or balance sheet

Accounting Problems

Inflation/seasonal factors distort ratios

Different/changing accounting practices complicate interpretation/comparison

Window dressing

Interpretation Requires Context

Ratio alone means little: compare with historical values, industry "norm" or firm's plans

Issues with Industry Averages

Diversified firms: Which industry?

What's so special about the average, anyway?

Ambiguity

What level is appropriate? To whom? Example: liquidity ratios

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DuPont Model

What determines shareholders' returns?

Control of expenses

Utilization of assets

Use of debt

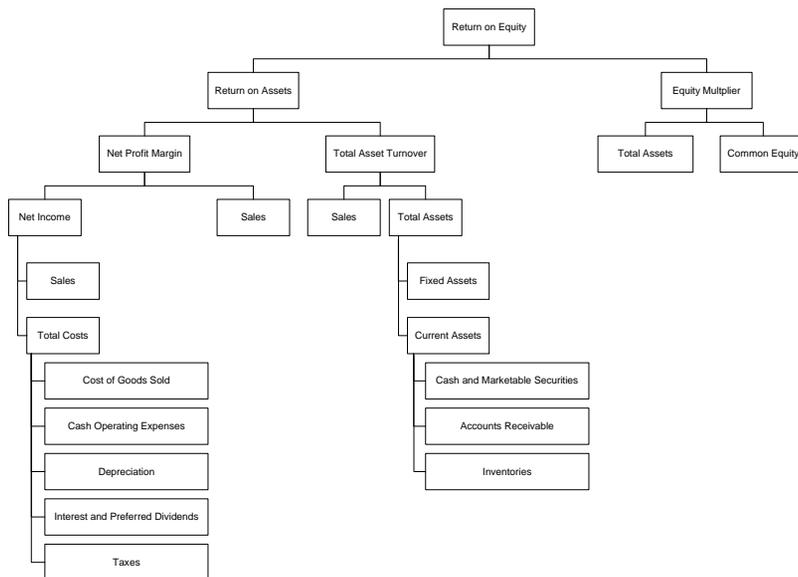
$$ROE = \frac{\text{Net Income}}{\text{Common Equity}}$$

$$= \underbrace{\frac{\text{Net Income}}{\text{Total Assets}}}_{ROA} \times \underbrace{\frac{\text{Total Assets}}{\text{Common Equity}}}_{\text{Equity Multiplier}}$$

$$= \underbrace{\frac{\text{Net Income}}{\text{Sales}}}_{\text{Net Profit Margin}} \times \underbrace{\frac{\text{Sales}}{\text{Total Assets}}}_{\text{Total Asset Turnover}} \times \underbrace{\frac{\text{Total Assets}}{\text{Common Equity}}}_{\text{Equity Multiplier}}$$

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DuPont Model: Detail



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Selected Ratios: Asset Management

How efficiently firm uses assets

Units: days or times per year

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

$$\text{Inventory Turnover} = \frac{\text{CoGS (or Sales)}}{\text{Inventory}}$$

$$\text{Average Collection Period (ACP) or Days' Sales Outstanding (DSO)} = \frac{\text{Accounts Receivable}}{\text{Daily (Credit) Sales}}$$

$$\text{Days' Sales in Cash} = \frac{\text{Cash and Marketable Securities}}{\text{Daily Sales}}$$

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Selected Ratios: Leverage (Liquidity)

Firm's ability to meet current obligations

Of particular interest to lenders and suppliers (may conflict with shareholders' goals)

Units: times per year

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick or Acid Test Ratio} = \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$$

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Selected Ratios: Leverage (Balance Sheet)

Use of "other people's money"

Financing, financial risk

Of interest to shareholders, creditors, especially in liquidation

Units: percent, proportion (e.g., 3:1)

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

$$\text{Debt-Equity Ratio} = \frac{\text{Long-term Debt}}{\text{Common Equity}}$$

$$\text{"Equity Multiplier"} = \frac{\text{Total Assets}}{\text{Common Equity}}$$

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Selected Ratios: Leverage (Market Values)

Restate "balance sheet ratios"

Financing, financial risk

Of interest to shareholders, creditors, especially in liquidation

Units: percent, proportion (e.g., 3:1)

$$\text{Market Value Debt Ratio} = \frac{\text{Market Value of Debt}}{\text{Market Value of Debt} + \text{Equity}}$$

$$\text{Market Value Debt-Equity Ratio} = \frac{\text{Market Value of Debt}}{\text{Market Value of Equity}}$$

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Selected Ratios: Leverage (Coverage)

Solvency: ability to service fixed annual financing costs

Of interest mainly to creditors

Units: times per year

$$\text{Times Interest Earned (TIE)} = \frac{\text{EBIT}}{\text{Interest}}$$

$$\text{Times Burden Covered} = \frac{\text{EBIT}}{\text{Interest} + \frac{\text{Principal Repayment}}{1 - T_C}}$$

$$\text{Cash Coverage} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$$

$$\text{Fixed Charge Coverage} = \frac{\text{EBIT} + \text{Lease Payments}}{\text{Interest} + \text{Lease Payments} + \frac{\text{Sinking Fund Payment}}{1 - T_C}}$$

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Selected Ratios: Profitability

Performance

Overall success of firm, shareholders

Of interest to shareholders, lenders

Units: percent

$$\text{Net Profit Margin (NPM)} = \frac{\text{Net Income}}{\text{Sales}}$$

$$\text{Gross Profit Margin (GPM)} = \frac{\text{Sales} - \text{CoGS}}{\text{Sales}}$$

$$\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

$$\text{Return on Equity (ROE)} = \frac{\text{Net Income}}{\text{Common Equity}}$$

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Selected Ratios: Profitability (Alternatives to ROA)

Performance

Overall success of firm, shareholders and other investors

Of interest to shareholders, lenders

Units: percent

$$\text{Basic Earning Power (BEP)} \\ \text{or Operating Income Return on Investment (OIROI)} = \frac{\text{EBIT}}{\text{Total Assets}}$$

$$\text{Return on Invested Capital (ROIC)} \\ \text{or Return on Net Assets (RONA)} = \frac{\text{EBIT}(1 - T_C)}{\text{Interest-bearing Debt} + \text{Equity}}$$

$$\text{ROE} = \text{BEP} + (\text{BEP} - \text{interest rate}) \left(\frac{\text{Total Debt}}{\text{Common Equity}} \right)$$

$$\text{ROE} = \text{ROIC} + [\text{ROIC} - \text{interest rate}(1 - T_C)] \left(\frac{\text{Interest-bearing Debt}}{\text{Common Equity}} \right)$$

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Selected Ratios: Market Value

Investors' view of firm's prospects

$$\text{Price/Earnings Ratio (P/E)} = \frac{\text{Price per Share}}{\text{Earnings per Share}} \\ = \frac{\text{Price per Share}}{\left(\frac{\text{Net Income}}{\text{Shares Outstanding}} \right)}$$

$$\text{Market to Book Value Ratio} = \frac{\text{Price per Share}}{\text{Book Value per Share}} \\ = \frac{\text{Price per Share}}{\left(\frac{\text{Common Equity}}{\text{Shares Outstanding}} \right)}$$

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