Using Ratios

- **Ratios are useful in assessing profitability, liquidity, and risk**
  - Highlight sources of competitive advantage and "red flag" potential trouble
- **Ratios must be compared to a benchmark**
  - Compare same firm across time (time-series analysis)
  - Compare firm to other firms or to industry (cross-sectional analysis)
- **Ratios are contextual**
  - Try to determine the underlying activity that the ratio represents to determine whether it is good or bad news
- **Key: Ratio analysis does not provide answers, but instead helps you ask better questions**

Misusing ratios

- **Standard ratios have multiple definitions**
  - There is no GAAP for ratio definitions
  - Use the same definition to make valid comparisons
- **Choosing the appropriate benchmark for comparison is important**
  - Major changes in the firm distort time-series analysis
  - Differences in business strategy, capital structure, or business segments distort cross-sectional analysis
  - Differences in accounting methods make all comparisons difficult
- **Ratios may be manipulated by managerial action**

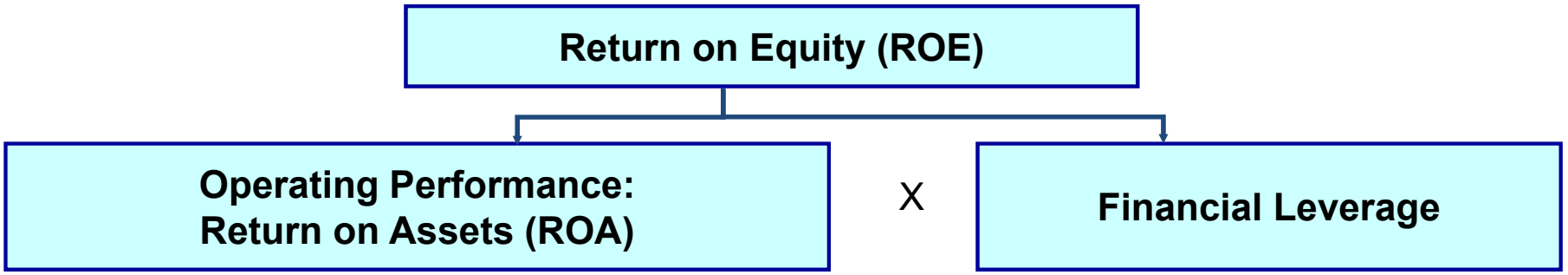
Return on Equity

- **Is a Net Income of $10,000,000 good or bad?**
  - Depends on level of investment required
- **Return on Equity (ROE)**
  - ROE = Net Income / Average Shareholders' Equity
  - The numerator represents how much return the company generated for shareholders during the year based on accrual accounting
  - The denominator represents the shareholders' investment in the company
    - Must take average of beginning and ending balances
  - Measures Return on Investment (ROI)
    - Should increase with the risk of the company

Drivers of ROE

- Two drivers of Return on Equity
- Operating performance
  - How effectively do managers use company resources (assets) to generate profits?
  - Return on Assets (ROA)
  - ROA = Net Income/Average Assets
- Financial leverage
  - How much do the managers use debt to increase available assets for a given level of shareholder investment?
  - Financial leverage = Avg. Assets/Avg. Shareholders' Equity
  - Note that this is different from many "leverage" ratios you hear about (e.g., debt-to-equity)

ROE Framework



ROE = Net Income/Assets x Assets/Equity

Example: Company raises $100 from shareholders and borrows $100 from bank to buy $200 of assets, which are used to generate $10 of net income

ROE = 10% (10/100), ROA = 5% (10/200), Leverage = 2 (200/100)

=> 10% = 5% x 2

Return on Assets

- Two drivers of Return on Assets
- Profitability
  - How much profit does the company earn on each dollar of sales?
  - Return on Sales (ROS)
  - ROS = Net Income/Sales
- Efficiency
  - How much sales does the company generate based on its available resources?
  - Asset Turnover
  - ATO = Sales/Avg. Assets

ROA and Leverage

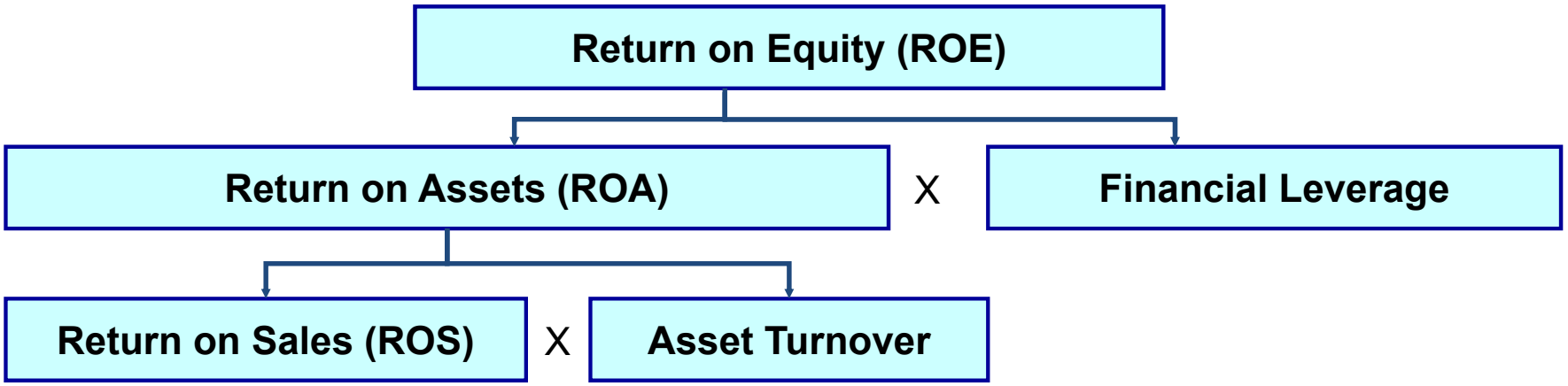
- Ideally, ROA would measure operating performance independent of the company's financing decisions
- But, the numerator of ROA, Net Income, includes Interest Expense
  - More leverage => higher Interest Expense => lower Net Income
- To truly remove all financing effects from ROA, we must de-lever Net Income
- ROA = De-Levered Net Income / Avg. Assets
- De-levered Net Income = Net Income + (1-t) x Interest Expense

ROA Example

De-levering NI removes effects of capital structure:

	No debt	Some debt
Pretax, pre-interest income	300	300
Interest expense	0	(50)
Pretax income	300	250
Taxes (35%)	(105)	(87.5)
Net income	195	162.5
De-levered Net Income	195	195 [162.5+50(1-.35)]

DuPont Ratio Analysis Framework



ROE = Net Income/Sales x Sales/Assets x Assets/Equity
= Profitability x Efficiency x Leverage