

The Math: Return on Equity

Management has two jobs:

1. Make money to invest in new assets.
2. Spend money wisely to increase shareholders' equity.

Pre-tax profit (PTP) Margin helps assess how well management is doing job 1, and return on equity (ROE) helps assess how well management is doing job 2. PTP and ROE are found in the Section Evaluate Management on the Stock Selection Guide.

This paper addresses the math associated with assessing ROE.

Shareholders' equity is the portion of the balance sheet that represents the capital received from investors in exchange for stock and retained earnings. It's calculated as a company's total assets minus its total liabilities, or

$$\text{Shareholders' Equity} = \text{Total Assets} - \text{Total Liabilities}$$

ROE reveals how much profit a company generates with the money shareholders have invested. It is calculated by dividing net income by shareholders' equity and expressing the result as a percentage, or

$$\text{ROE} = (\text{Net Income/Equity}) \times 100$$

Applying a little algebra allows ROE to be rewritten as

$$\text{ROE} = \left(\frac{\text{Net Income}}{\text{Sales}} \right) \times 100 \times \left(\frac{\text{Sales}}{\text{Assets}} \right) \times \left(\frac{\text{Assets}}{\text{Equity}} \right)$$

Net Profit Margin *Asset Turnover Ratio* *Financial Leverage*

Note that sales cancel each other from the denominator to the numerator in the first two terms and assets cancel each other in the second and third terms in a similar manner. With these cancellations, the equation above equals the standard definition of ROE given earlier.

The first term is net profit margin, the second term is asset turnover ratio, and the third term is financial leverage. Net profit margin shows what percentage of sales after all expenses are paid (including taxes) is returned as profit; asset turnover ratio shows how well management is using assets to grow sales, and the financial leverage ratio shows how well management is using borrowed funds to increase shareholders' equity.

These three terms are evaluated to determine their influence on trends in ROE.