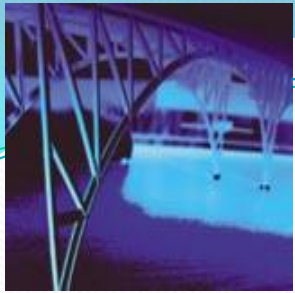


# Financial Statement Analysis



# Profitability

Margins and return ratios provide information on the profitability of a company and the efficiency of the company.

1. A **margin** is a portion of revenues that is a profit.
2. A **return** is a comparison of a profit with the investment/asset necessary to generate the profit.



# Profitability ratios

$$\text{Net profit margin} = \frac{\text{Net profit after tax}}{\text{Sales}}$$

$$\text{Gross operating margin} = \frac{\text{Sales less Cost of sales}}{\text{Sales}}$$

$$\text{Net operating margin} = \frac{\text{Net profit before interest and tax}}{\text{Sales}}$$

$$\text{Return on equity (ROE)} = \frac{\text{Net profit after tax}}{\text{Equity}}$$

$$\text{Return on assets (ROA)} = \frac{\text{Net profit before interest}}{\text{Total assets}}$$

$$= \frac{\text{Net profit after tax} + (\text{interest} * (1 - \text{tax rate}))}{\text{Total assets}}$$

$$\text{Return on capital employed (ROCE)} = \frac{\text{Net profit before interest on LT-debt}}{\text{Equity} + \text{LT-debt}}$$

$$\text{Earnings per share (EPS)} = \frac{\text{Net profit after tax}}{\text{Number of shares outstanding}}$$



# Profitability ratios: Margins

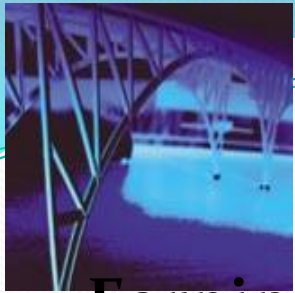
- Each margin ratio compares a measure of income with total revenues:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Total revenue}}$$

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Total revenue}}$$

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Total revenue}}$$

$$\text{Pretax profit margin} = \frac{\text{Earnings before taxes}}{\text{Total revenue}}$$

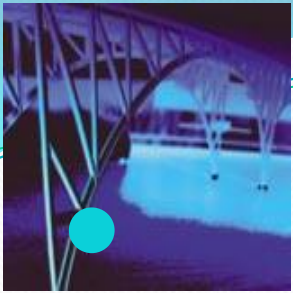


**Earnings, (or net income,)** are simply revenues minus costs. They are an accounting measure of profits.

Earnings would not be a good measure of economic profits given that the financial statements are subject to accounting rules.

Earnings measure the return to equity holders. The calculation subtracts debt interest payments and taxes owed.

Earnings Before Interest and Taxes (EBIT) is also an important measure of profit. It includes payments that go to debt holders and the tax authority.

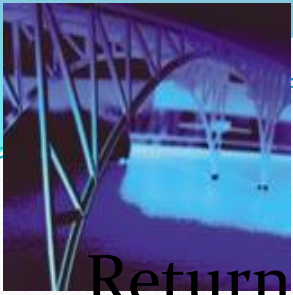


## ● Retained earnings

- Retained earnings are the earnings re-invested into the firm:

Retained earnings = earnings - dividends

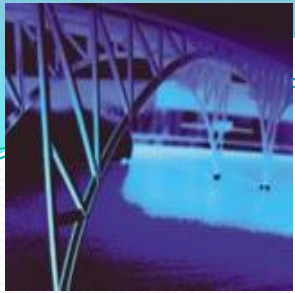
- The balance sheet can grow in one of three ways:
  - 1. Internally, through retained earnings.
  - 2. Externally by issuing new equity.
  - 3. Externally by issuing new debt.



## Measuring profit

Return on equity (ROE) uses accounting values: earnings divided by book value of equity.

- ROE will not be the same as the firm's stock return over the period.
- Given that ROE uses accounting earnings as the profit measure, it is sensitive to the manipulations discussed above.
- Earnings are measured over a period of time, (ie. year,) whereas the book value of equity on the balance sheet is at a specific point of time.

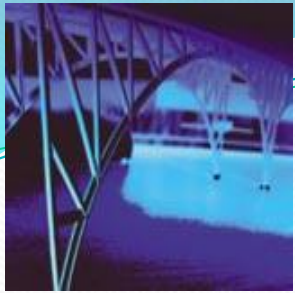


## Return on assets

- Return on assets (ROA) is another important measure of portability.
- Again, ROA uses earnings to measure profit, but divides by the firm's book value.
- ROA is insensitive to the firm's financing decision.
- Thus, it is a measure of operating portability.



# AAA's Balance Sheet (Asset Side)



## AAA's Balance Sheet (thousands) Dec. 31, 2015 <sup>a</sup>

Cash and C.E.	\$	90	
Account. Receivables. <sup>c</sup>		394	
Inventories		696	
Prepaid Expenses <sup>d</sup>		5	
Accumulated Tax Prepay		<u>10</u>	
<b>Current Assets<sup>e</sup></b>	<b>\$1,195</b>		
Assets (@Cost) <sup>f</sup>	1030		Fixed
Depr. <sup>g</sup>	(329)		Less: Acc.
			<b>Net Fix.</b>
			<u>701</u>
			<b>Investment, LT</b>
			<b>50 Other Assets, LT</b>
<u>223</u>			<b>Total Assets<sup>b</sup></b>
			<b>\$2,169</b>

- How the firm stands on a specific date.
- What AAA owned.
- Amounts owed by customers.
- Future expense items already paid.
- Cash/likely convertible to cash within 1 year.
- Original amount paid.
- Acc. deductions for wear and tear.



# AAA's Balance Sheet (Liability Side)

## AAA Balance Sheet (thousands) Dec. 31, 2015

Notes Payable	\$ 290	
Account Payables <sup>c</sup>	94	
Accrued Taxes <sup>d</sup>	16	Other
Accrued Liab. <sup>d</sup>	<u>100</u>	
Current Liab. <sup>e</sup>	\$ 500	
Long-Term Debt <sup>f</sup>	530	
<u>Shareholders' Equity</u>		Com.
Stock (\$1 par) <sup>g</sup>	200	Add Pd in
Capital <sup>g</sup>	729	Retained
Earnings <sup>h</sup>	<u>210</u>	Total Equity
	\$1,139	
Total Liab/Equity <sup>a,b</sup>	\$2,169	

- a. Note, Assets = Liabilities + Equity.
- b. What AAA owed and ownership position.
- c. Owed to suppliers for goods and services.
- d. Unpaid wages, salaries, etc.
- e. Debts payable < 1 year.
- f. Debts payable > 1 year.
- g. Original investment.
- h. Earnings reinvested.



# AAA's Income Statement

## AAA Profit and Losses Statement (in thousands) for Year Ending December 31, 2015<sup>a</sup>

Net Sales	\$ 2,211	Cost of Goods Sold <sup>b</sup>	<u>1,599</u>	Gross Profit	\$ 612
		SG&A Expenses <sup>c</sup>	<u>402</u>	EBIT <sup>d</sup>	\$ 210
		Interest Expense <sup>e</sup>	<u>59</u>	EBT <sup>f</sup>	\$ 151
		Income Taxes	<u>60</u>	EAT <sup>g</sup>	\$ 91
		Cash Dividends	<u>38</u>	Increase in RE	\$ 53

- Measures profitability over a time period.
- Received, or receivable, from customers.
- Sales comm., adv., officers' salaries, etc.
- Operating income.
- Cost of borrowed funds.
- Taxable income.
- Amount earned for shareholders.



# Profitability Ratios

Income Statement /  
Balance Sheet  
Ratios

Profitability Ratios

Indicates the efficiency of operations and firm pricing policies.

Gross Profit Margin

$$\frac{\text{Gross Profit}}{\text{Net Sales}}$$

For *Basket Wonders* December  
31, 2007

$$\frac{\$612}{\$2,211} = .277$$



# Profitability

## Ratio Comparisons

### Gross Profit Margin

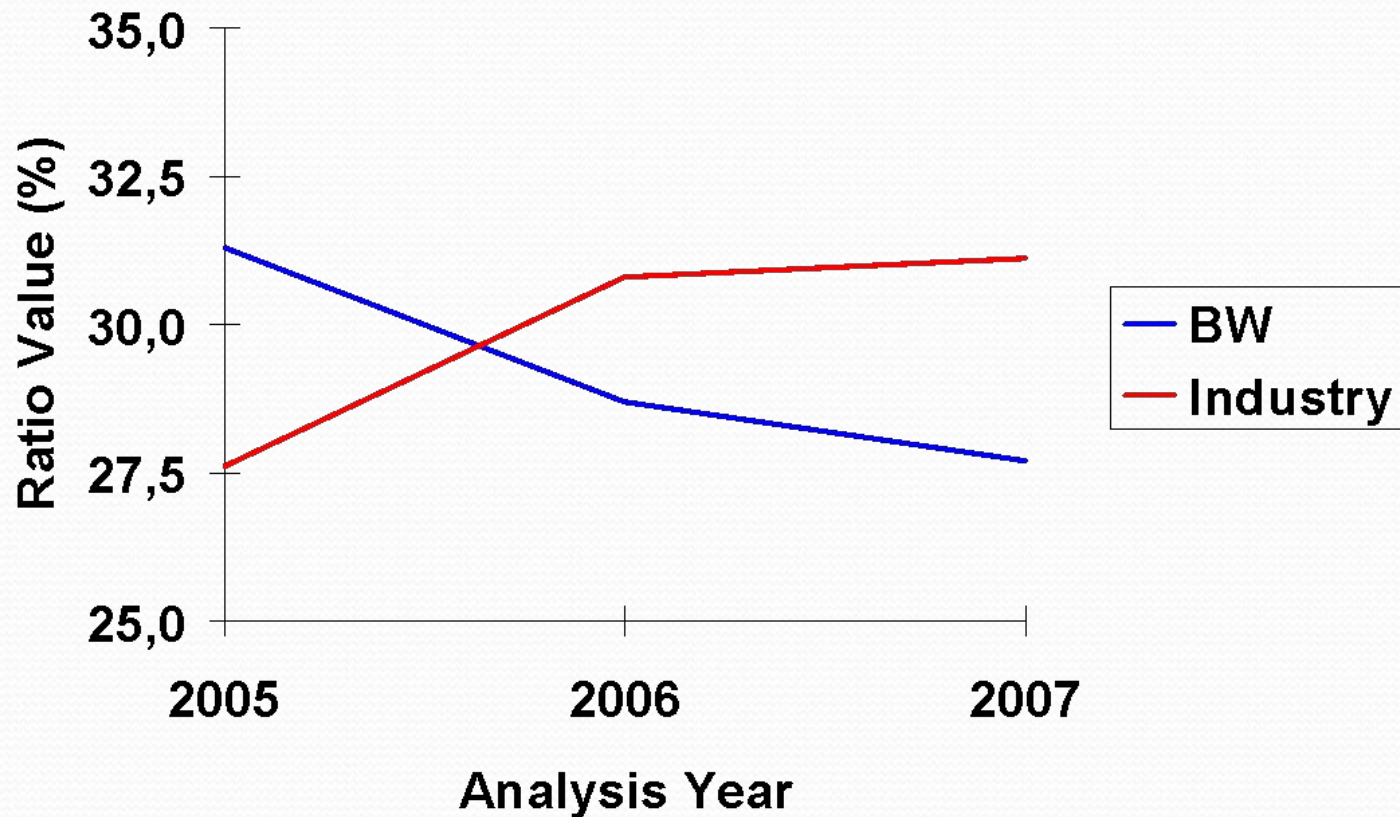
<u>Year</u>	<u>BW</u>	<u>Industry</u>
2007	27.7%	31.1%
2006	28.7	30.8
2005	31.3	27.6

**BW has a weak Gross Profit Margin.**



# Gross Profit Margin -- Trend Analysis Comparison

## Trend Analysis of Gross Profit Margin





# Profitability Ratios

**Income Statement /  
Balance Sheet  
Ratios**

**Profitability Ratios**

Indicates the firm's profitability after taking account of all expenses and income taxes.

*Net Profit Margin*

*Net Profit after Taxes*

---

*Net Sales*

For *Basket Wonders* December  
31, 2007

$$\frac{\$91}{\$2,211} = .041$$



# Profitability Ratio Comparisons

## Net Profit Margin

<u>Year</u>	<u>BW</u>	<u>Industry</u>
2007	4.1%	8.2%
2006	4.9	8.1
2005	9.0	7.6

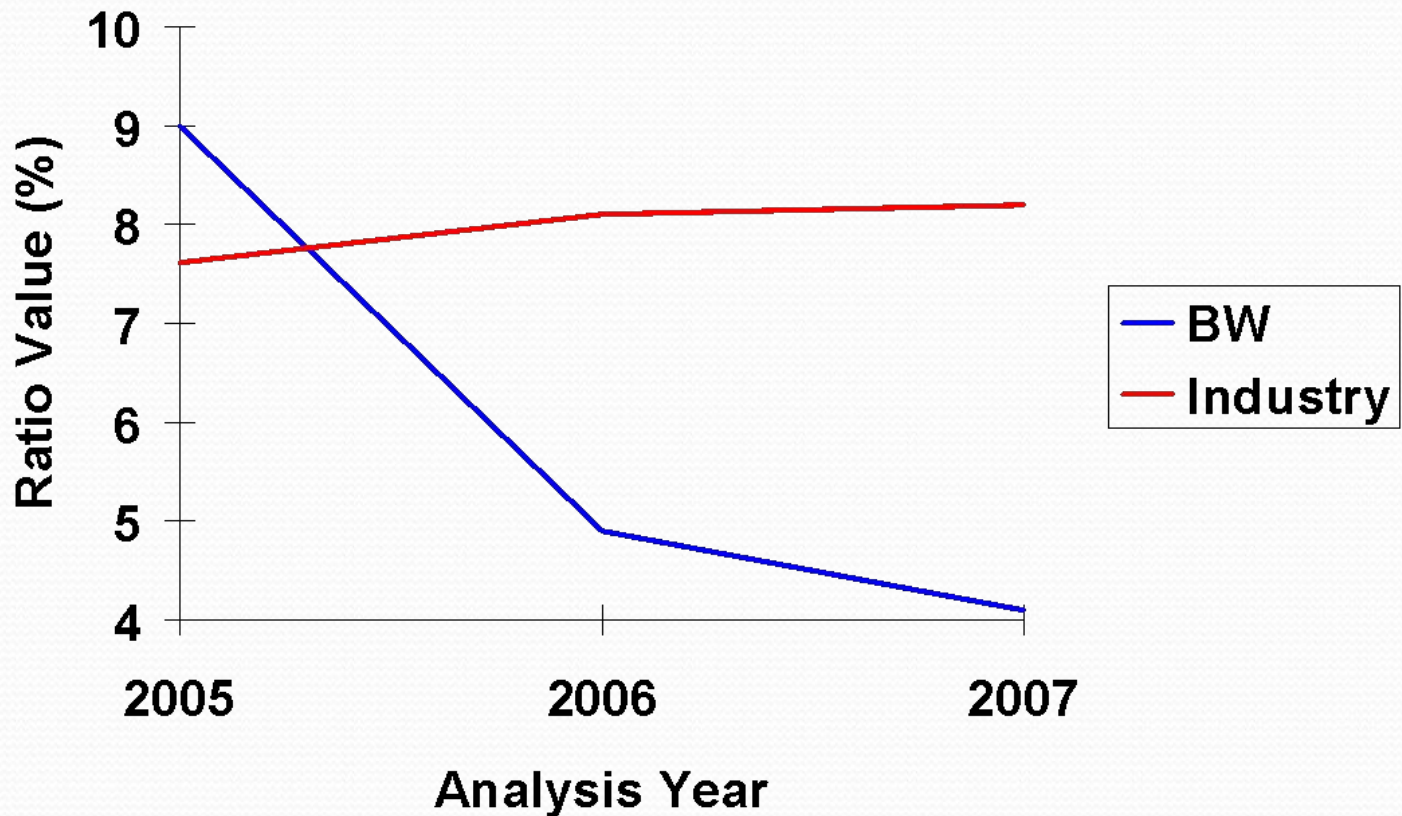
**BW has a poor Net Profit Margin.**





# Net Profit Margin -- Trend Analysis Comparison

## Trend Analysis of Net Profit Margin





# Profitability Ratios: Returns

Each margin ratio compares a measure of income with total revenues:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Total revenue}}$$

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Total revenue}}$$

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Total revenue}}$$

$$\text{Pretax profit margin} = \frac{\text{Earnings before taxes}}{\text{Total revenue}}$$



# Profitability Ratios

**Income Statement /  
Balance Sheet  
Ratios**

**Profitability Ratios**

Indicates the profitability on the assets of the firm (after all expenses and taxes).

*Return on Assets*

*Net Income after Taxes*  
-----  
*Total Assets*

For *Basket Wonders* December  
31, 2007

$$\frac{\$91}{\$2,160} = .042$$



# Profitability Ratio Comparisons

## Return on Investment

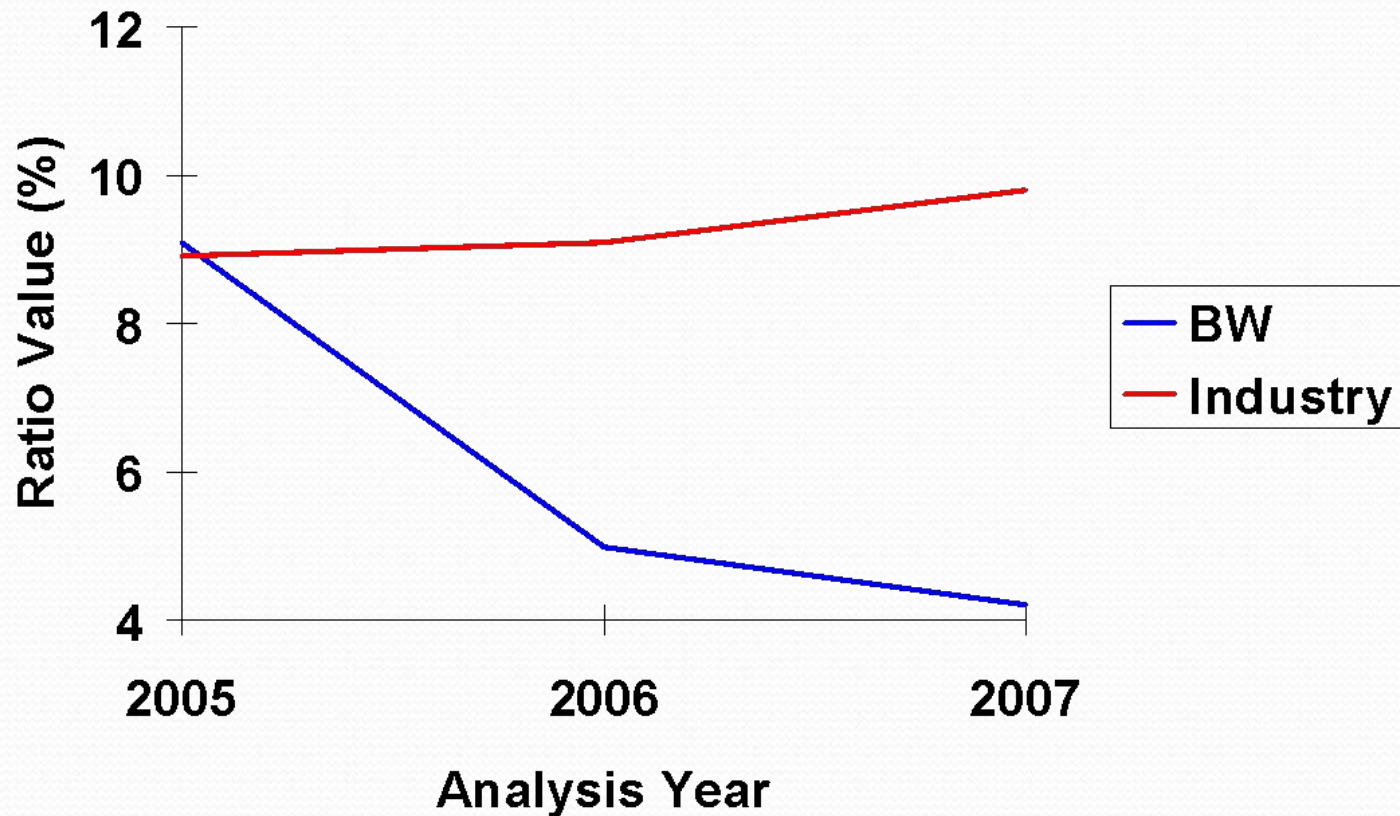
<u>Year</u>	<u>BW</u>	<u>Industry</u>
2007	4.2%	9.8%
2006	5.0	9.1
2005	9.1	10.8

**BW has a poor Return on Investment.**



# Return on Investment – Trend Analysis Comparison

## Trend Analysis of Return on Investment





# Profitability Ratios

Income Statement /  
Balance Sheet  
Ratios

Profitability Ratios

Indicates the profitability to the shareholders of the firm (after all expenses and taxes).

Return on Equity

Net Income after Taxes  
Shareholders' Equity

For *Basket Wonders* December  
31, 2007

$$\frac{\$91}{\$1,139} = .08$$

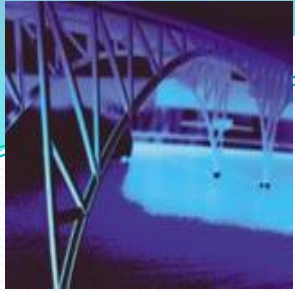


# Profitability Ratio Comparisons

## Return on Equity

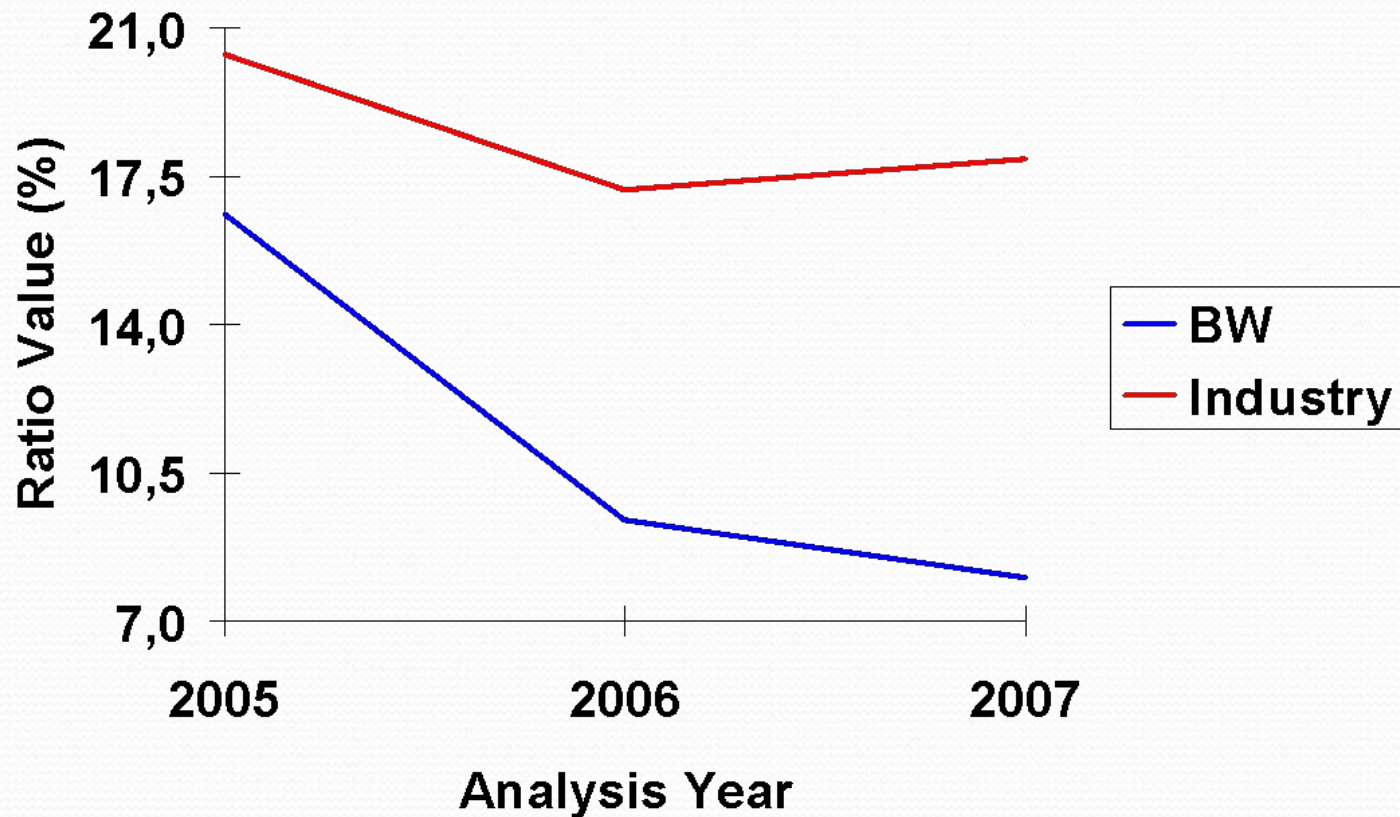
<u>Year</u>	<u>BW</u>	<u>Industry</u>
2007	8.0%	17.9%
2006	9.4	17.2
2005	16.6	20.4

**BW has a poor Return on Equity.**



# Return on Equity -- Trend Analysis Comparison

## Trend Analysis of Return on Equity

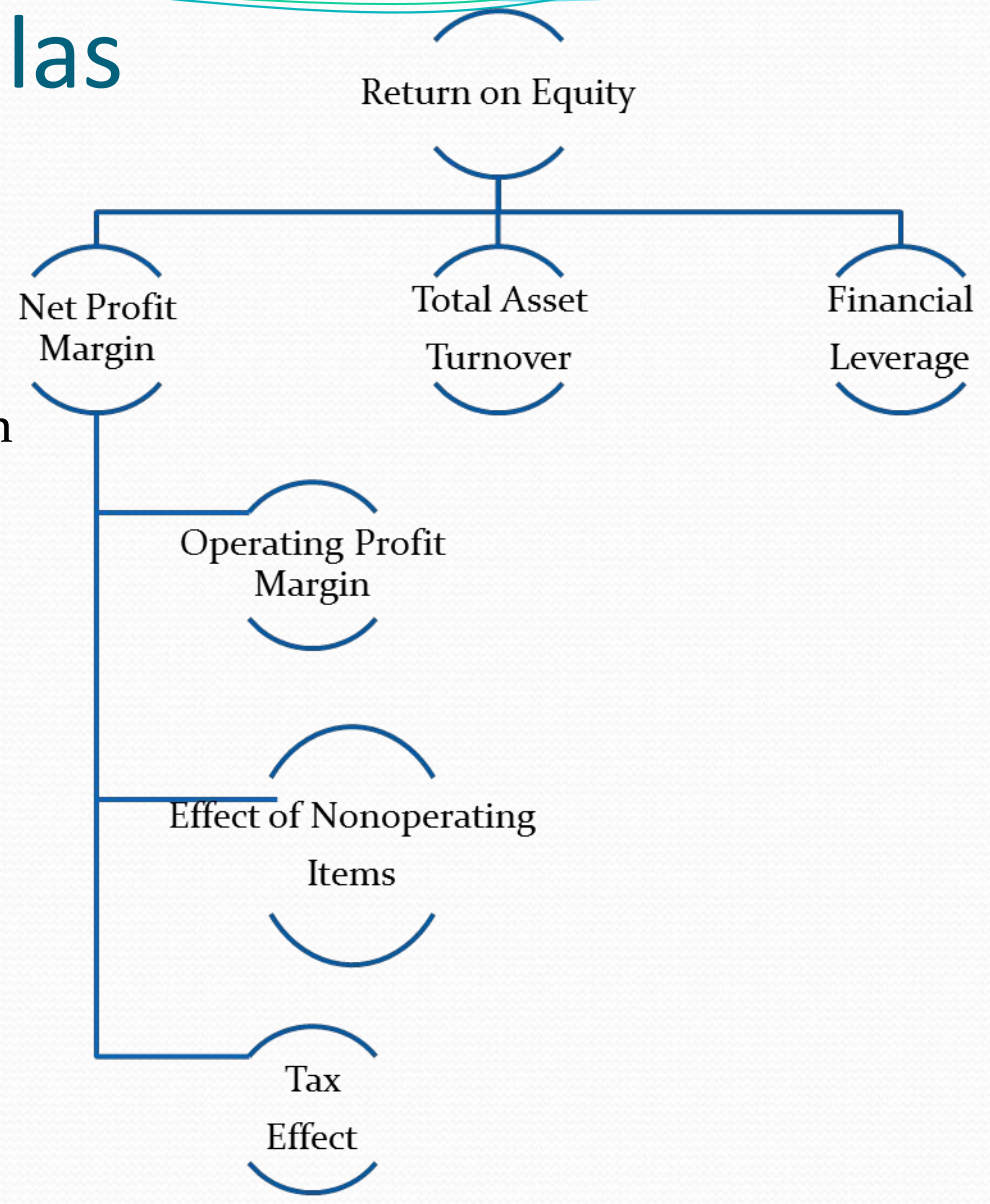






# The DuPont Formulas

- The DuPont formula uses the relationship among financial statement accounts to decompose a return into components.
- Three-factor DuPont for the return on equity:
  - Total asset turnover
  - Financial leverage
  - Net profit margin
- Five-factor DuPont for the return on equity:
  - Total asset turnover
  - Financial leverage
  - Operating profit margin
  - Effect of nonoperating items
  - Tax effect





# Five-Component DuPont Model

- Each margin ratio compares a measure of income with total revenues:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Total revenue}}$$

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Total revenue}}$$

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Total revenue}}$$

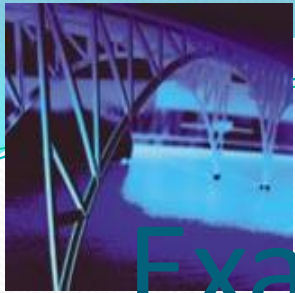
$$\text{Pretax profit margin} = \frac{\text{Earnings before taxes}}{\text{Total revenue}}$$



# Example: The DuPont Formula

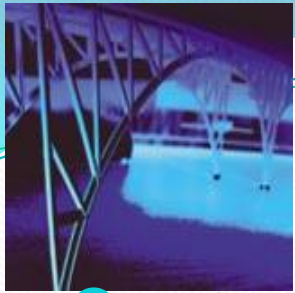
Suppose that an analyst has noticed that the return on equity of the D Company has declined from FY2012 to FY2013. Using the DuPont formula, explain the source of this decline.

<i>(millions)</i>	<u>2013</u>	<u>2012</u>
Revenues	\$1,000	\$900
Earnings before interest and taxes	\$400	\$380
Interest expense	\$30	\$30
Taxes	\$100	\$90
Total assets	\$2,000	\$2,000
Shareholders' equity	\$1,250	\$1,000



# Example: the DuPont Formula

	<u>2013</u>	<u>2012</u>
Return on equity	0.20	0.22
Return on assets	0.13	0.11
Financial leverage	1.60	2.00
Total asset turnover	0.50	0.45
Net profit margin	0.25	0.24
Operating profit margin	0.40	0.42
Effect of non-operating items	0.83	0.82
Tax effect	0.76	0.71



# Other Ratios

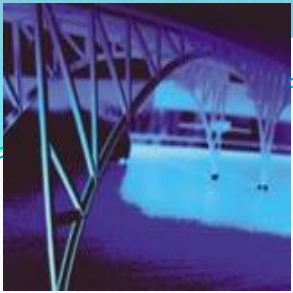
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$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Total revenue}}$$

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Total revenue}}$$

$$\text{Pretax profit margin} = \frac{\text{Earnings before taxes}}{\text{Total revenue}}$$



# Other Ratios

- Each margin ratio compares a measure of income with total revenues:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Total revenue}}$$

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Total revenue}}$$

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Total revenue}}$$

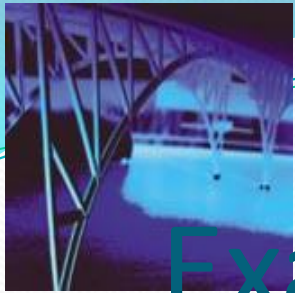
$$\text{Pretax profit margin} = \frac{\text{Earnings before taxes}}{\text{Total revenue}}$$



## Example: Shareholder ratios

Calculate the book value per share, P/E, dividends per share, dividend payout, and plowback ratio based on the following financial information:

Book value of equity	\$100 million
Market value of equity	\$500 million
Net income	\$30 million
Dividends	\$12 million
Number of shares	100 million



# Example: Shareholder Ratios

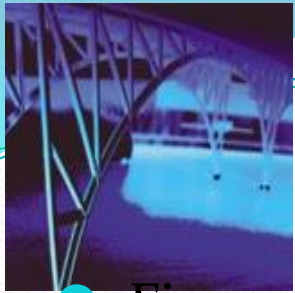
Book value per share	\$1.00	There is \$1 of equity, per the books, for every share of stock.
P/E	16.67	The market price of the stock is 16.67 times earnings per share.
Dividends per share	\$0.12	The dividends paid per share of stock.
Dividend payout ratio	40%	The proportion of earnings paid out in the form of dividends.
Plowback ratio	60%	The proportion of earnings retained by the company.





# Effective Use of Ratio Analysis

- In addition to ratios, an analyst should describe the company (e.g., line of business, major products, major suppliers), industry information, and major factors or influences.
- Effective use of ratios requires looking at ratios
  - Over time.
  - Compared with other companies in the same line of business.
  - In the context of major events in the company (for example, mergers or divestitures), accounting changes, and changes in the company's product mix.



# Summary

- Financial ratio analysis and common-size analysis help gauge the financial performance and condition of a company through an examination of relationships among these many financial items.
- A thorough financial analysis of a company requires examining its efficiency in putting its assets to work, its liquidity position, its solvency, and its profitability.
- We can use the tools of common-size analysis and financial ratio analysis, including the DuPont model, to help understand where a company has been.
- We then use relationships among financial statement accounts in pro forma analysis, forecasting the company's income statements and balance sheets for future periods, to see how the company's performance is likely to evolve.