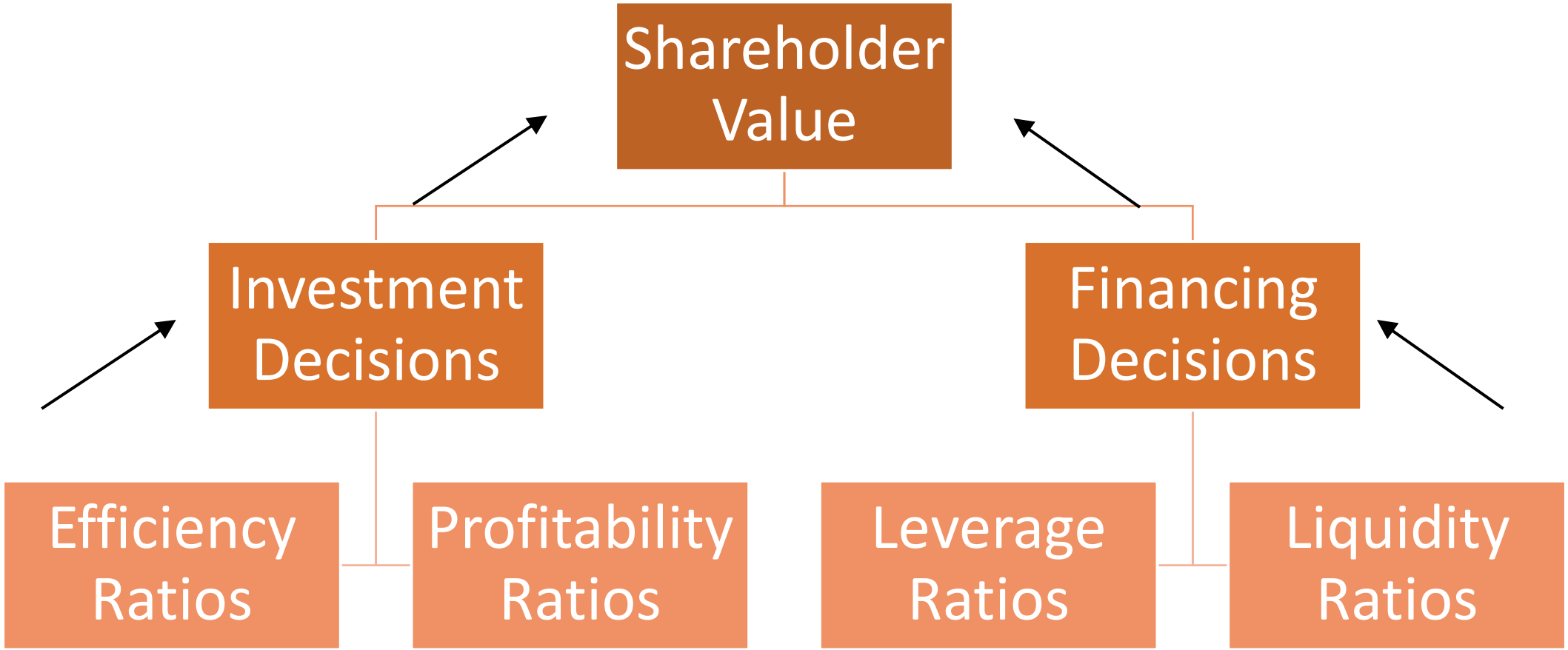
FINANCIAL MANAGEMENT

CH IV

Financial Ratio Analysis

Financial Ratios & Shareholder Value



Shareholder value depends on good investment and financing decisions.

Financial Ratios help measure the success and soundness of these decisions.

Using Financial Ratios

Financial ratios standardize the financial information on the income statement and balance sheet.

A ratio by itself may have no meaning.

A given ratio is generally compared to:

- ratios from previous years;
- ratios of other firms in the same industry.

Using Ratio Analysis

Interested parties:

Current and prospective shareholders are interested in the firm's current and future level of risk and return, which directly affect share price.

Creditors are interested in the short-term liquidity of the company and its ability to make interest and principal payments.

Management is concerned with all aspects of the firm's financial situation, and it attempts to produce financial ratios that will be considered favorable by both owners and creditors.

Using Ratio Analysis (Cont'd)

Question	Category of Ratios Used to Address the Question
1. How liquid is the firm? Will it be able to pay its bills as they come due?	Liquidity ratios
2. How has the firm financed the purchase of its assets?	Capital structure ratios
3. How efficient has the firm's management been in utilizing its assets to generate sales?	Asset management efficiency ratios
4. Has the firm earned adequate returns on its investments?	Profitability ratios
5. Are the firm's managers creating value for shareholders?	Market value ratios

Summary - Ratio Analysis (Cont'd)

I. Liquidity Ratios

① Current ratio
② Acid-test (quick) ratio
③ Cash ratio

II. Profitability

① Gross/operating/net profit margin
② Operating return on assets (ROA)
③ Return on equity (ROE)

III. Capital structure

① Debt ratio
② Times interest earned ratio (interest coverage ratio)

IV. Efficiency (Turnover) Ratios

① Total asset turnover ratio
② Fixed asset turnover ratio
③ Accounts receivable turnover ratio
④ Average collection period on accounts receivable
⑤ Inventory turnover ratio
⑥ Days' sales in inventory

V. Market value

① Price to earnings ratio (PE)
② Market-to-book ratio

I. LIQUIDITY RATIOS

- A firm is financially liquid if it is able to pay its bills on time.

- Comparing the firm's current assets to the firm's current liabilities,
  - current ratio,
  - quick ratio
  - cash ratio

Maturity Match vs Maturity Mismatch

Maturity matching or hedging approach is a strategy of working capital financing wherein short term requirements are met with short-term debts and long-term requirements with long-term debts.

Long Term Funds will Finance = Fixed Assets + Permanent Working Capital

Short Term Funds will Finance = Temporary Working Capital

Permanent Assets Financed With Short Term Financing

In this situation, the borrower has to renew or refinance the short term loan every time simply because the duration for which money is required is higher. This firm is exposed to refinancing risk.

If the lender for any reason denies for renewal, what will the firm do?

Temporary Assets Financed With Long Term Financing

In this situation, firstly, the borrower has to pay interest on long term loans for that period also when the loan is not getting utilized.

Secondly, the interest rate of long-term loans is normally dearer to short term loans due to the concept of term premium. These two additional costs hit the profitability of the firm.

Current Ratio

Current Ratio: compares a firm's current (liquid) assets to its current (short-term) liabilities.

Current ratio = Current assets ÷ Current liabilities

The current ratio for Bartlett Company in 2015 is:

$1,223,000 ÷ $620,000 = 1.97

Liquidity (Quick-Acid Test) Ratio

The overall liquidity of a firm is also analyzed by computing the Acid-Test (Quick) Ratio.

This ratio excludes the inventory from current assets as inventory may not always be very liquid.

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

Cont'd

The quick (acid-test) ratio excludes inventory, which is generally the least liquid current asset.

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

The quick ratio for Bartlett Company in 2015 is:

$$\frac{\$1{,}223{,}000 - \$289{,}000}{\$620{,}000} = \frac{\$934{,}000}{\$620{,}000} = 1.51$$

Matter of Fact

Company	Current ratio	Quick ratio
Dell	1.3	1.2
Home Depot	1.3	0.4
Lowes	1.3	0.2

- All three firms have current ratios of 1.3. However, the quick ratios for Home Depot and Lowes are dramatically lower than their current ratios, but for Dell the two ratios are nearly the same.
- Why?

Cash Ratio

A company's most liquid assets are its holdings of cash and marketable securities

Cash Ratio =

(cash+marketable securities)/current liabilities

Cash ratio = Cash + Marketable sec ÷ Current liabilities

The cash ratio for Bartlett Company in 2015 is:

$431,000 ÷ $620,000 = 0.69

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

SUMMARIZING ALL RATIOS

We can use ***Bartlett Company's ratios*** to perform a complete ratio analysis using both cross-sectional and time-series analysis approaches. The 2015 ratio values calculated earlier and the ratio values calculated for 2013 and 2014 for Bartlett Company, along with the industry average ratios for 2015, are summarized which also shows the formula used to calculate each ratio.

Using these data, we can discuss the five key aspects of Bartlett's performance— ***liquidity, activity, debt, profitability, and market.***

I. Liquidity

The overall liquidity of the firm seems to exhibit a reasonably stable trend, having been maintained at a level that is relatively consistent with the industry average in 2015.
The firm's liquidity seems to be good.

Discuss ***NWC and Maturity Match comparing with the Generally Accepted Accounting Principles***

II. EFFICIENCY (ACTIVITY/TURNOVER) RATIOS

- They are commonly referred to as ***turnover ratios*** as they reflect the number of times a particular asset account balance turns over during a year.

- ***Measure the speed*** with which various accounts are collected into ***sales*** or ***cash***….

The Inventory Turnover Ratio

Inventory turnover measures the ***activity, or liquidity, of a firm's inventory.***

Inventory turnover = Cost of goods sold ÷ Inventory

Applying this relationship to Bartlett Company in 2015 yields:

$2,088,000 ÷ $289,000 = 7.2 **(times)**

Average Days in Inventory

Another way to express inventory tunover is to look at ***how many days of output are represented by inventories.***

Average days in Inventory = 365 ÷ Inventory turnover

For Bartlett Company, the average age of inventory in 2015 is:

365 ÷ 7.2 = 50.7 ***(days)***

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

The Receivables Turnover Ratio

Receivables turnover measures the ***activity, or liquidity, of a firm's trade receivables.***

Receivables turnover = Net Sales (***in credit***) ÷ Receivables

Applying this relationship to Bartlett Company in 2015 yields:

$3,074,000 ÷ $503,000 = 6.1 (**times**)

Average Collection Period

Another way to express receivables tunover is to ***find average collection period.***

The ***average collection period is the average amount of time needed to collect accounts receivable***

Average collection period = 365 ÷ receivables turnover

For Bartlett Company, the average age of receivables in 2015 is:

365 ÷ 6.1 = 59.7 **(days)**

Average Collection Period

The average collection period is the ***average amount of time needed to collect accounts receivable.***

$$\text{Average collection period} = \frac{\text{Accounts receivable}}{\text{Average sales per day}} = \frac{\text{Accounts receivable}}{\frac{\text{Annual sales}}{365}}$$

- The average collection period for Bartlett Company in 2015 is:

$$\frac{\$503{,}000}{\frac{\$3{,}074{,}000}{365}} = \frac{\$503{,}000}{\$8{,}422} = 59.7 \text{ days}$$

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

The Operating Cycle (OC)

- A firm's operating cycle (OC) is ***the time from the beginning of the production process to collection of cash from the sale of the finished product.***

- It is measured in elapsed time by ***summing the Average Age of Inventory (AAI) and the Average Collection Period (ACP).***

$$\mathbf{OC = AAI + ACP}$$

The Payables Turnover Ratio

- Payables turnover measures the activity, or liquidity, of a firm's trade payables.

- Payables turnover = Purchases (***in credit***) ÷ Payables

- If we assume that Bartlett Company's purchases equaled 70 percent of its cost of goods sold in 2015, its average payment period is:
  Applying this relationship to Bartlett Company in 2015 yields:

  $2,088,000 (0.70) ÷ $382,000 = 3.8 **(times)**

The Average Payment Period

Another way to express payables tunover is ***to find average payment period.***

The average payment period is the ***average amount of time needed to pay accounts payable.***

Average payment period = 365 ÷ payables turnover

For Bartlett Company, the average age of payables in 2015 is:

365 ÷ 3.8 = 95.4 **(days)**

The Payment Turnover

The average payment period is the ***average amount of time needed to pay accounts payable.***

$$\text{Average payment period} = \frac{\text{Accounts payable}}{\text{Average purchases per day}} = \frac{\text{Accounts payable}}{\frac{\text{Annual purchases}}{365}}$$

If we assume that Bartlett Company's ***purchases equaled 70 percent of its cost of goods sold in 2015***, its average payment period is:

$$\frac{\$382{,}000}{\frac{0.70 \times \$2{,}088{,}000}{365}} = \frac{\$382{,}000}{\$4{,}004} = 95.4 \text{ days}$$

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

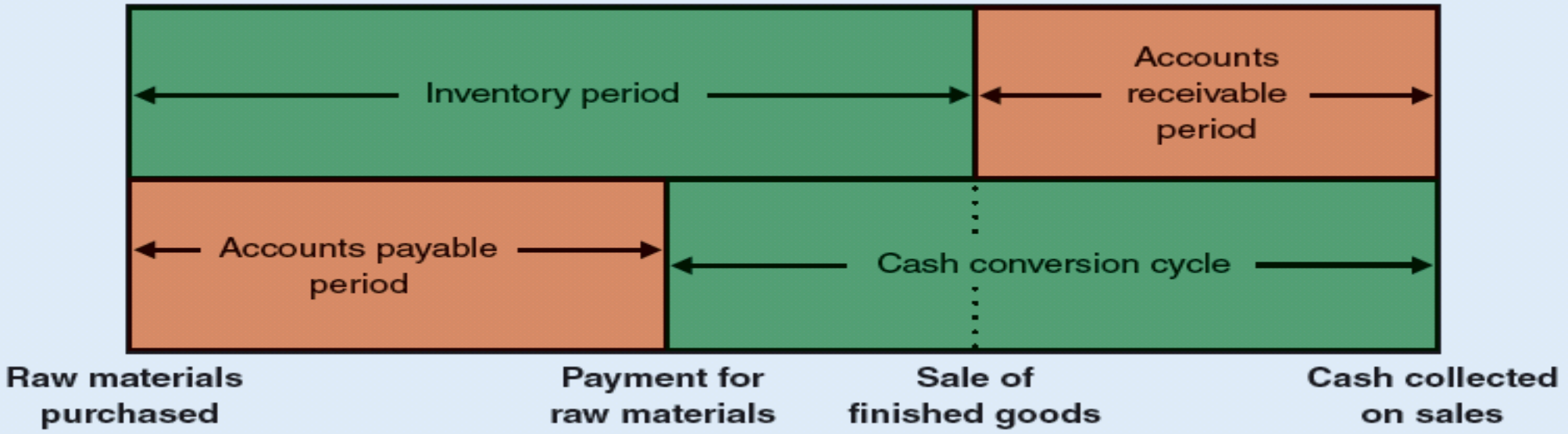
Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

Calculating the Cash Conversion Cycle (CCC)

- The process of ***producing and selling a product also includes the purchase of production inputs (raw materials) on accou***nt, which results in accounts payable.
- The time it takes to pay the accounts payable, measured in days, is the average payment period (APP).
-
- The operating cycle less the average payment period yields the cash conversion cycle. The formula for the cash conversion cycle is:

$$\mathbf{CCC = OC - APP}$$

The Cash Conversion Cycle (CCC)



Cash Conversion Cycle	=	Inventory Period	+	Receivables Period	-	Accounts Payable Period

TIFFANY vs IKEA

	Tiffany	Ikea
Sales	2,709	65,357
COGS	1,179	45,583
Inventories	1,428	7,179
Accounts receivable	165	6,966
Accounts payable	299	9,631

Tiffany sells fine jewelry

Ikea sells a wide range of household goods at attractive prices

Would you expect Tiffany or Ikea to have the higher CCC?

The Asset Turnover Ratio

Sales-to-assets ratio shows how much sales are generated by each dollarof total assets.

It measures ***how hard the firm's assets are working.***

Total asset turnover = Sales ÷ Total assets

The value of Bartlett Company' s total asset turnover in 2015 is:

$3,074,000 ÷ $3,597,000 = 0.85

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

Activity (Turnover/Efficiency – Summary

Bartlett Company's inventory appears to be in good shape. Its inventory management seems to have improved, and in 2015 it performed at a level above that of the industry. ***The firm may be experiencing some problems with accounts receivable***. The average collection period seems to have crept up above that of the industry. Bartlett also appears to be slow in paying its bills; it pays nearly 30 days slower than the industry average. ***This could adversely affect the firm's credit standing.*** Although overall liquidity appears to be good, the management of receivables and payables should be examined.

Bartlett's total asset turnover reflects a decline in the efficiency of total asset utilization between 2013 and 2014. Although in 2015 it rose to a level considerably above the industry average, it appears that the pre-2014 level of efficiency has not yet been achieved.

III. CAPITAL STRUCTURE RATIOS

- Capital structure refers ***to the way a firm finances its assets.***

- Capital structure ratios address the important question: ***How has the firm financed the purchase of its assets?***

- ***debt ratio*** (temporary debt ratio vs permanent debt ratio)
- ***debt to equity*** ratio (financial leverage)
- ***times interest earned ratio***

The Debt Ratio

The debt ratio measures the ***proportion of total assets financed by the firm's creditors.***

Debt ratio = Total liabilities ÷ Total assets

The debt ratio for Bartlett Company in 2015 is

$1,643,000 ÷ $3,597,000 = 0.457 = 45.7%

The Debt-to-Equity Ratio

The ***debt-to-equity*** ratio measures the relative proportion of total liabilities and common stock equity used to finance the firm's total assets.

Debt to equity = Total liabilities ÷ Common stock equity

The debt-to-equity ratio for Bartlett Company in 2015 is

$1,643,000 ÷ $1,754,000 = 0.937 = **93.7%**

The Times Interest Earned Ratio

The times interest earned ratio measures the firm's ability to make contractual interest payments; sometimes called ***the interest coverage ratio.***

$$\text{Times Interest Earned} = \frac{\text{Operating Income or EBIT}}{\text{Interest Expense}}$$

Applying this ratio to Bartlett Company yields the following 2015 value:

$418,000 ÷ $93,000 = 4.49 (**times**)

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

Debt - Summary

Bartlett Company's indebtedness increased over the 2013–2015 period and is currently above the industry average. Although this increase in the debt ratio could be cause for alarm, the firm's ability to meet interest and fixed-payment obligations improved, from 2014 to 2015, to a level that outperforms the industry.

The firm's increased indebtedness in 2014 apparently caused deterioration in its ability to pay debt adequately. However, ***Bartlett has evidently improved its income in 2015 so that it is able to meet its interest and fixed-payment obligations at a level consistent with the average in the industry.***

In summary, it appears that although 2014 was an off year, the company's improved ability to pay debts in 2015 compensates for its increased degree of indebtedness

IV. Profitability Ratios

Profitability ratios address a very fundamental question:

Has the firm earned adequate returns on its investments?

- Two fundamental determinants of firm's profitability and returns on investments are the following:
  - ***Cost Control***
    - Is the firm controlling costs and earning reasonable profit margin?
  - ***Efficiency of asset utilization***
    - Is the firm efficiently utilizing the assets to generate sales?

Gross Profit Margin

Gross profit margin measures the percentage of each sales dollar remaining after the firm has paid for its goods.

$$\text{Gross profit margin} = \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}} = \frac{\text{Gross profits}}{\text{Sales}}$$

Bartlett Company's gross profit margin for 2015 is:

$$\frac{\$3{,}074{,}000 - \$2{,}088{,}000}{\$3{,}074{,}000} = \frac{\$986{,}000}{\$3{,}074{,}000} = 0.321 = 32.1\%$$

Operating Profit (EBIT) Margin

Operating profit margin measures ***the percentage of each sales dollar remaining after all costs and expenses other than interest, taxes, and preferred stock dividends are deducted.***

Operating profit margin = Operating profits ÷ sales

Bartlett Company' s operating profit margin for 2015 is:

$418,000 ÷ $3,074,000 = 13.6%

Net Profit Margin

Net profit margin measures the ***percentage of each sales dollar remaining after all costs and expenses, including interest, taxes, and preferred stock dividends, have been deducted***.

Net profit margin = Earnings available for common stockholders ÷ Sales

Bartlett Company's net profit margin for 2015 is:

$221,000 ÷ $3,074,000 = 0.072 = 7.2%

Earnings per Share (EPS)

Earnings per share represents the number of dollars earned during the period on the behalf of each outstanding share of common stock.

$$\text{Earnings per share} = \frac{\text{Earnings available for common stockholders}}{\text{Number of shares of common stock outstanding}}$$

Bartlett Company's earnings per share (EPS) in 2015 is:

$221,000 ÷ 76,262 = $2.90

Return on Assets (ROA)

The return on total assets measures the overall effectiveness of management in generating profits with its available assets.

Return on total assets (ROA) = Earnings available for common stockholders ÷ Total assets

Bartlett Company's return on total assets in 2015 is:

$221,000 ÷ $3,597,000 = 0.061 = 6.1%

Return on Equity (ROE)

The return on equity measures the return earned on common stockholders' investment in the firm.

Return on Equity (ROE) = Earnings available for common stockholders ÷ Common stock equity

This ratio for Bartlett Company in 2015 is:

$221,000 ÷ $1,754,000 = 0.126 = 12.6%

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages)

Ratio	Formula	Year 2013[a]	Year 2014[b]	Year 2015[b]	Industry average 2015[c]	Evaluation[d] Cross-sectional 2015	Evaluation[d] Time-series 2013–2015	Evaluation[d] Overall
Liquidity								
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	2.04	2.08	1.97	2.05	OK	OK	OK
Quick (acid-test) ratio	$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	1.32	1.46	1.51	1.43	OK	Good	Good
Activity								
Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Inventory}}$	5.1	5.7	7.2	6.6	Good	Good	Good
Average collection period	$\frac{\text{Accounts receivable}}{\text{Average sales per day}}$	43.9 days	51.2 days	59.7 days	44.3 days	Poor	Poor	Poor
Average payment period	$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$	75.8 days	81.2 days	95.4 days	66.5 days	Poor	Poor	Poor
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	0.94	0.79	0.85	0.75	OK	OK	OK
Debt								
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	36.8%	44.3%	45.7%	40.0%	OK	OK	OK
Times interest earned ratio	$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$	5.6	3.3	4.5	4.3	Good	OK	OK
Fixed-payment coverage ratio	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Int.} + \text{Lease pay.} + \{(\text{Prin.} + \text{Pref. div.}) \times [1/(1-T)]\}}$	2.4	1.4	1.9	1.5	Good	OK	Good
Profitability								
Gross profit margin	$\frac{\text{Gross profits}}{\text{Sales}}$	31.4%	33.3%	32.1%	30.0%	OK	OK	OK
Operating profit margin	$\frac{\text{Operating profits}}{\text{Sales}}$	14.6%	11.8%	13.6%	11.0%	Good	OK	Good
Net profit margin	$\frac{\text{Earnings available for common stockholders}}{\text{Sales}}$	8.2%	5.4%	7.2%	6.2%	Good	OK	Good

Profitability

Bartlett's profitability relative to sales in 2015 was better than the average company in the industry, although it did not match the firm's 2013 performance. Although the *gross* profit margin was better in 2014 and 2015 than in 2013, higher levels of operating and interest expenses in 2014 and 2015 appear to have caused the 2015 *net* profit margin to fall below that of 2013. However, Bartlett Company's 2015 net profit margin is quite favorable when compared to the industry average.

The firm's earnings per share, return on total assets, and return on common equity behaved much as its net profit margin did over the 2013–2015 period. Bartlett appears to have experienced either a sizable drop in sales between 2013 and 2014 or a rapid expansion in assets during that period. The exceptionally high 2015 level of return on common equity suggests that the firm is performing quite well.

The firm's above-average returns—net profit margin, EPS, ROA, and ROE—may be attributable to the fact that it is more risky than average. A look at market ratios is helpful in assessing risk.

V. MARKET VALUE RATIOS

Market value ratios address the question, how are the firm's shares valued in the stock market?

① Price-Earnings Ratio (PE ratio)=Market price per share/earnings per share, indicates how much investors are currently willing to pay for $1 of reported earnings.

② Market-to-Book Ratio=Market price per share/book value per share, measures the relation between the market value and the accumulated investment in the firm's equity.

The Price-Earnings (P/E) Ratio

The price/earnings (P/E) ratio measures the amount ***that investors are willing to pay for each dollar of a firm's earnings.***

Price Earnings (P/E) Ratio =
Market price per share of common stock ÷ Earnings per share

If Bartlett Company's common stock at the end of 2015 was selling at $32.25, using the EPS of $2.90, the P/E ratio at year-end 2015 is:

$32.25 ÷ $2.90 = 11.12

The Market to Book Value (M/B) Ratio

The market/book (M/B) ratio ***provides an assessment of how investors view the firm's performance.***

$$\text{Market/book (M/B) ratio} = \frac{\text{Market price per share of common stock}}{\text{Book value per share of common stock}}$$

$$\text{Book value per share of common stock} = \frac{\text{Common stock equity}}{\text{Number of shares of common stock outstanding}}$$

The Market to Book Value (M/B) Ratio

Substituting the appropriate values for Bartlett Company from its 2015 balance sheet, we get:

Substituting Bartlett Company's end of 2015 common stock price of $32.25 and its $23.00 book value per share of common stock (calculated above) into the M/B ratio formula,

we get:

$32.25 ÷ $23.00 = 1.40

Summary of Bartlett Company Ratios (2013–2015, Including 2015 Industry Averages) (Cont.)

Ratio	Formula	Year			Industry average	Evaluation[d]		
		2013[a]	2014[b]	2015[b]	2015[c]	Cross-sectional 2015	Time-series 2013–2015	Overall
Profitability (cont.)								
Earnings per share (EPS)	$\frac{\text{Earnings available for common stockholders}}{\text{Number of shares of common stock outstanding}}$	$3.26	$1.81	$2.90	$2.26	Good	OK	Good
Return on total assets (ROA)	$\frac{\text{Earnings available for common stockholders}}{\text{Total assets}}$	7.8%	4.2%	6.1%	4.6%	Good	OK	Good
Return on equity (ROE)	$\frac{\text{Earnings available for common stockholders}}{\text{Common stock equity}}$	13.7%	8.5%	12.6%	8.5%	Good	OK	Good
Market								
Price/earnings (P/E) ratio	$\frac{\text{Market price per share of common stock}}{\text{Earnings per share}}$	10.5	10.0[e]	11.1	12.5	OK	OK	OK
Market/book (M/B) ratio	$\frac{\text{Market price per share of common stock}}{\text{Book value per share of common stock}}$	1.25	0.85[e]	1.40	1.30	OK	OK	OK

[a]Calculated from data not included in this chapter.
[b]Calculated by using the financial statements presented in Tables 3.1 and 3.2.
[c]Obtained from sources not included in this chapter.
[d]Subjective assessments based on data provided.
[e]The market price per share at the end of 2014 was $18.06.

Market – Summary

Investors have greater confidence in the firm in 2015 than in the prior 2 years, as reflected in the price/earnings (P/E) ratio. However, this ratio is below the industry average. The P/E ratio suggests that the firm's risk has declined but remains above that of the average firm in its industry. The firm's market/book (M/B) ratio has increased over the 2013–2015 period, and in 2015 it exceeds the industry average. This implies that investors are optimistic about the firm's future performance. The P/E and M/B ratios reflect the firm's increased profitability over the 2013–2015 period: Investors expect to earn high future returns as compensation for the firm's above-average risk.

In summary, the firm appears to be growing and has recently undergone an expansion in assets, financed primarily through the use of debt. The 2014–2015 period seems to reflect a phase of adjustment and recovery from the rapid growth in assets. Bartlett's sales, profits, and other performance factors seem to be growing with the increase in the size of the operation. In addition, the market response to these accomplishments appears to have been positive. In short, the firm seems to have done well in 2012.

THE DUPONT SYSTEM OF ANALYSIS

- The DuPont system of analysis is used to ***dissect the firm's financial statements and to assess its financial condition.***

- It merges the income statement and balance sheet into two summary measures of ***profitability.***

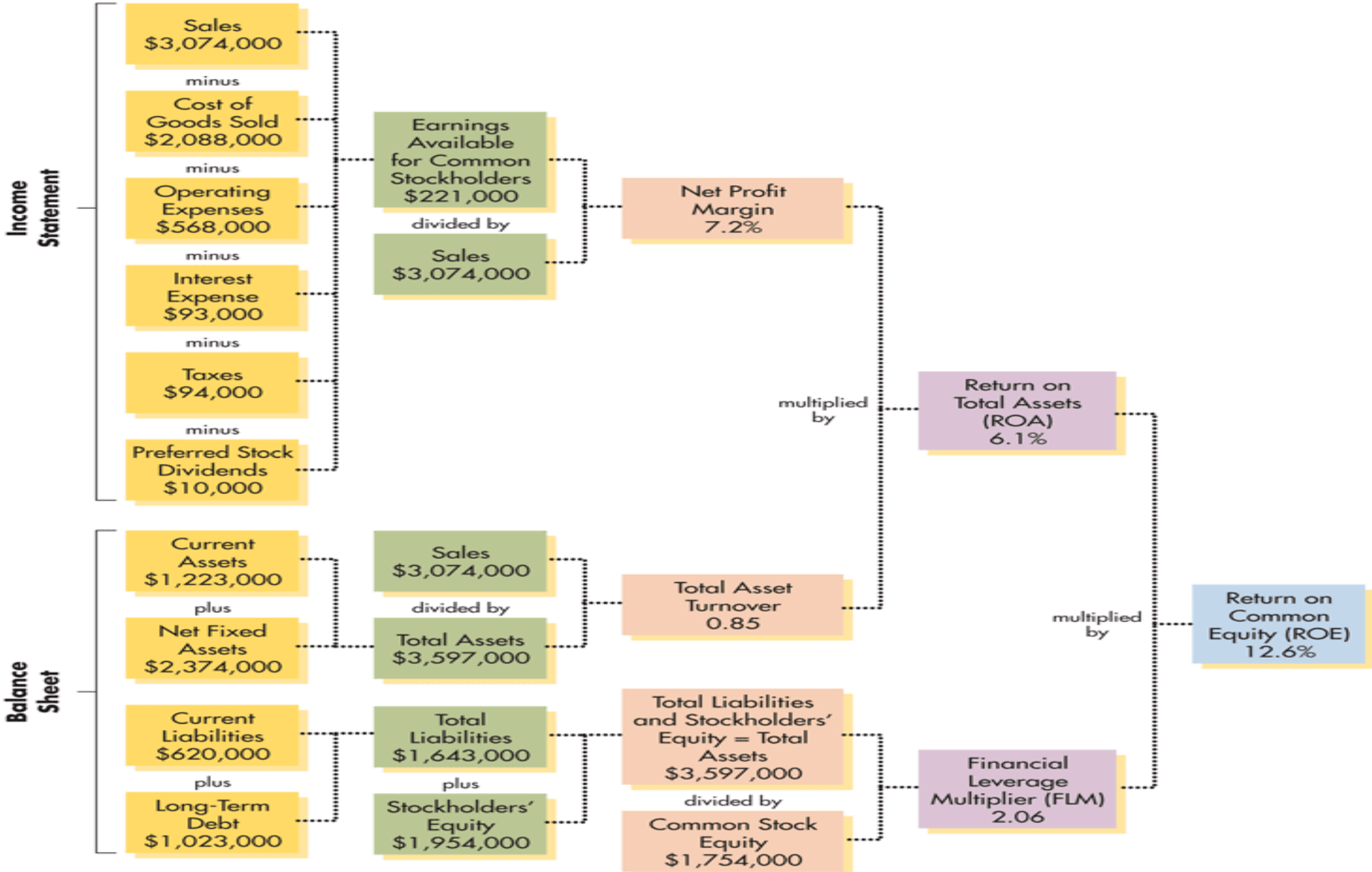
The DuPont System of Analysis

- The DuPont system *first brings together the net profit margin, which measures the firm's profitability on sales, with its total asset turnover,* which indicates how efficiently the firm has used its assets to generate sales.

$$\text{ROA} = \text{Net profit margin} \times \text{Total asset turnover}$$

- Substituting the appropriate formulas into the equation and simplifying results in the formula given earlier,

$$\text{ROA} = \frac{\text{Earnings available for common stockholders}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Earnings available for common stockholders}}{\text{Total assets}}$$


Income Statement
Sales $3,074,000
minus
Cost of Goods Sold $2,088,000
minus
Operating Expenses $568,000
minus
Interest Expense $93,000
minus
Taxes $94,000
minus
Preferred Stock Dividends $10,000
Earnings Available for Common Stockholders $221,000
divided by
Sales $3,074,000
Net Profit Margin 7.2%
multiplied by
Return on Total Assets (ROA) 6.1%
Balance Sheet
Current Assets $1,223,000
plus
Net Fixed Assets $2,374,000
Sales $3,074,000
divided by
Total Assets $3,597,000
Total Asset Turnover 0.85
Current Liabilities $620,000
plus
Long-Term Debt $1,023,000
Total Liabilities $1,643,000
plus
Stockholders' Equity $1,954,000
Total Liabilities and Stockholders' Equity = Total Assets $3,597,000
divided by
Common Stock Equity $1,754,000
Financial Leverage Multiplier (FLM) 2.06
multiplied by
Return on Common Equity (ROE) 12.6%

The DuPont System of Analysis

When the 2015 values of the net profit margin and total asset turnover for Bartlett Company, calculated earlier,

are substituted into the DuPont formula, the result is:

$$\textbf{ROA} = 7.2\% \times 0.85 = 6.1\%$$

The DuPont System of Analysis: The Modified DuPont Formula

- The modified DuPont Formula relates the ***firm's return on total assets to its return on common equity.*** The latter is calculated by multiplying the return on total assets (ROA) by the financial leverage multiplier (FLM), which is the ratio of total assets to common stock equity:

$$\text{ROE} = \text{ROA} \times \text{FLM}$$

- Substituting the appropriate formulas into the equation and simplifying results in the formula given earlier,

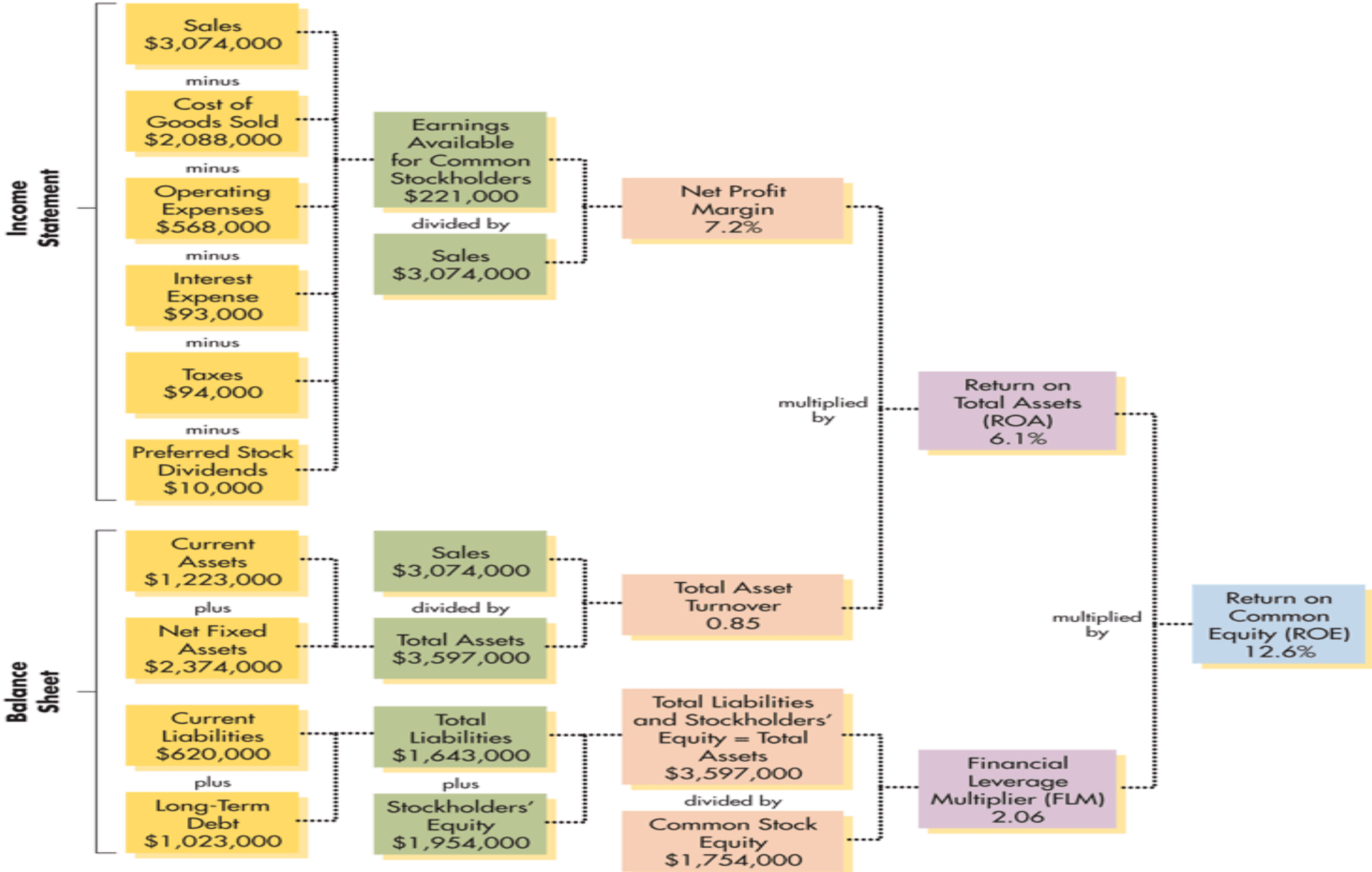
$$\text{ROE} = \frac{\text{Earnings available for common stockholders}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common stock equity}} = \frac{\text{Earnings available for common stockholders}}{\text{Common stock equity}}$$

The Modified DuPont Formula

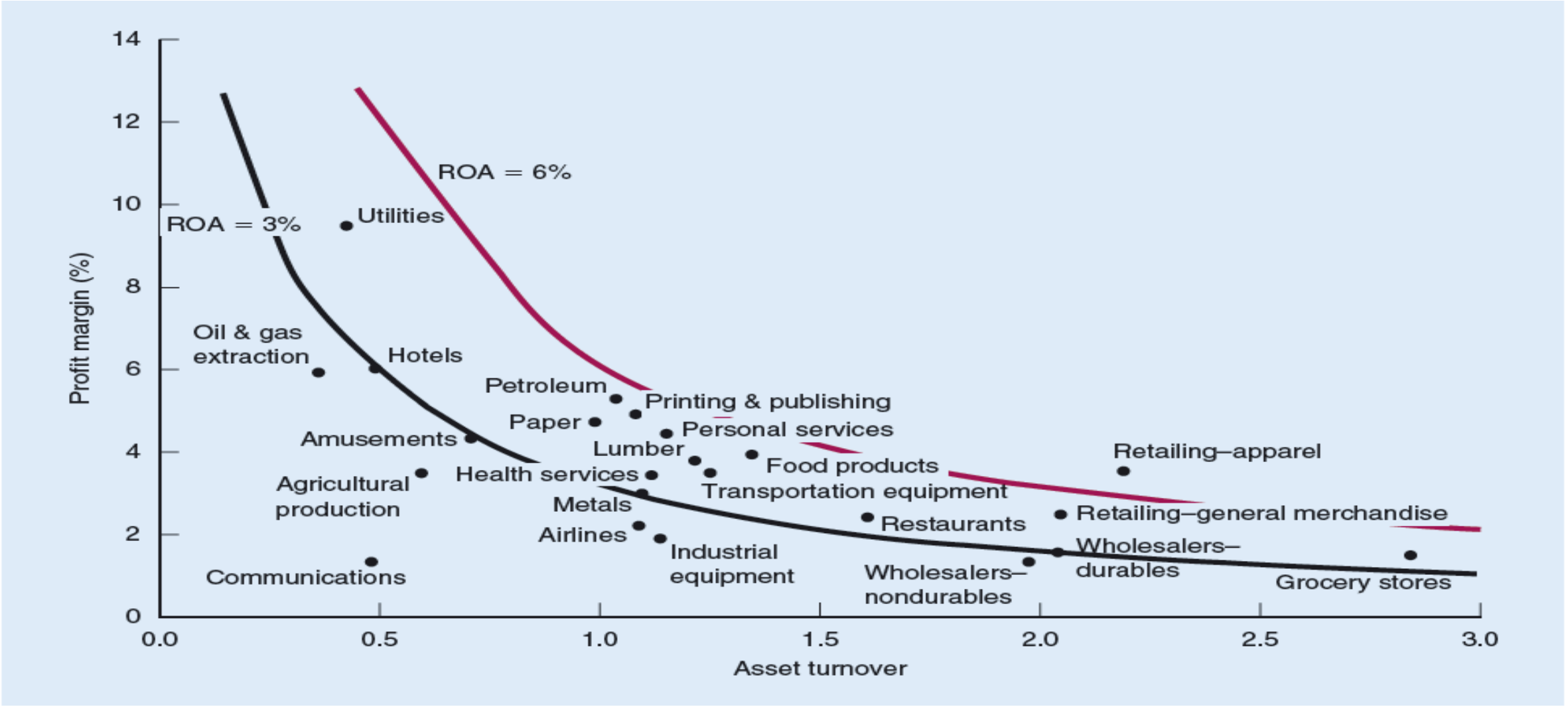
Substituting the values for Bartlett Company's ROA of 6.1 percent, calculated earlier,

and Bartlett's FLM of 2.06 ($3,597,000 total assets ÷ $1,754,000 common stock equity) into the modified DuPont formula yields:

$$\text{ROE} = 6.1\% \times 2.06 = 12.6\%$$


Income Statement
Sales $3,074,000
minus
Cost of Goods Sold $2,088,000
minus
Operating Expenses $568,000
minus
Interest Expense $93,000
minus
Taxes $94,000
minus
Preferred Stock Dividends $10,000
Earnings Available for Common Stockholders $221,000
divided by
Sales $3,074,000
Net Profit Margin 7.2%
multiplied by
Return on Total Assets (ROA) 6.1%
Balance Sheet
Current Assets $1,223,000
plus
Net Fixed Assets $2,374,000
Sales $3,074,000
divided by
Total Assets $3,597,000
Total Asset Turnover 0.85
Current Liabilities $620,000
plus
Long-Term Debt $1,023,000
Total Liabilities $1,643,000
plus
Stockholders' Equity $1,954,000
Total Liabilities and Stockholders' Equity = Total Assets $3,597,000
divided by
Common Stock Equity $1,754,000
Financial Leverage Multiplier (FLM) 2.06
multiplied by
Return on Common Equity (ROE) 12.6%

ROA Decomposition by Industry



The Limitations of Ratio Analysis

1. Picking an industry benchmark can sometimes be difficult.
2. Published peer-group or industry averages are not always representative of the firm being analyzed.
3. An industry average is not necessarily a desirable target or norm.
4. Accounting practices differ widely among firms.
5. Many firms experience seasonal changes in their operations.
6. Financial ratios offer only clues. We need to analyze the numbers in order to fully understand the ratios.
7. The results of financial analysis are dependent on the quality of the financial statements.

Cautions about using Ratio Analysis

4. Ratios that reveal large deviations from the norm merely indicate the possibility of a problem.
5. A single ratio does not generally provide sufficient information from which to judge the overall performance of the firm.
6. The ratios being compared should be calculated using financial statements dated at the same point in time during the year.
7. It is preferable to use audited financial statements.
8. The financial data being compared should have been developed in the same way.
9. Results can be distorted by inflation.

The table below shows the common-sized IS for six firms and description of their operations.

a) Edison: generates and sells electricity to businesses and households in capital-intensive plants

b) Delta Air: provides airline transportation services

c) Tiffany: designer, manufacturer, and retailer of jewelry and specialty items (including timepieces and silver)

d) Hewlett-Packard: manufactures and sells computers, printers and other hardware.

e) Kroger Stores: operates a chain of grocery store nationwide.

f) Kelly Services: provides temporary office services to other firms.

Use the clues you can find to match the firms listed common-sized financial statements and explain your reasoning.

	1	2	3	4	5	6
Sales	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Other revenue	-	-	0.5	0.9	-	-
Costs of Goods and Services Sold	(73.6)	(81.4)	(60.6)	(63.0)	(61.3)	(44.5)
Selling and Administrative Expenses	(19.9)	(14.1)	(17.9)	(24.0)	(5.0)	(36.8)
Depreciation	(2.1)	(0.8)	(5.1)	(3.4)	(8.7)	(4.1)
Interest	(1.4)	-	(8.0)	(0.9)	(7.3)	(0.1)
Income Taxes	(1.4)	(1.5)	(3.3)	(2.9)	(6.7)	(6.5)
Net income	1.6%	2.2%	5.6%	6.7%	11.0%	10.3%

Financial Ratios for Select Firms and Their Industry Median Values

	Current ratio	Quick ratio	Inventory turnover	Average collection period (days)	Total asset turnover	Debt ratio	Net profit margin (%)	Return on total assets (%)	Return on common equity (%)
Dell	1.3	1.2	40.5	58.9	1.6	0.8	2.7	4.3	25.4
Hewlett-Packard	1.2	1.1	13.8	80.6	1.0	0.6	6.7	6.7	18.9
Computers	2.5	2.1	5.8	61.3	0.9	0.4	−3.1	−2.2	−2.6
Home Depot	1.3	0.4	4.3	5.3	1.6	0.5	4.0	6.5	13.7
Lowe's	1.3	0.2	3.7	0.0	1.4	0.4	3.7	5.4	9.3
Building materials	2.8	0.8	3.7	5.3	1.6	0.3	4.0	6.5	13.7
Kroger	1.0	0.3	12.0	4.3	3.3	0.8	0.1	0.3	1.4
Whole Foods Market	1.3	1.0	25.6	7.0	3.6	0.4	2.3	8.0	14.5
Grocery stores	1.3	0.7	11.1	7.5	2.4	0.6	2.1	3.1	9.8
Sears	1.3	0.3	3.7	5.4	1.8	0.6	0.5	0.9	2.6
Wal-Mart	0.9	0.3	9.0	3.7	2.4	0.6	3.5	8.4	20.3
Merchandise stores	1.7	0.6	4.1	3.7	2.3	0.5	1.5	4.9	10.8

The data used to calculate these ratios are drawn from the Compustat North American database.

QUESTIONS

- Which firm can easily get credit?
- Which firms sell fast?
- Calculate the operation cycle of the firms'. Explain the differences.