

Financial Statement Analysis

Curriculum designed for use
with the Iowa Electronic
Markets

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Financial Statement Analysis: Lecture Outline

- Review of Financial Statements
- Ratios
 - Types of Ratios
 - Examples
- The DuPont Method
- Ratios and Growth
- Summary
 - Strengths
 - Weaknesses
 - Ratios and Forecasting

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The Analysis of Financial Statements

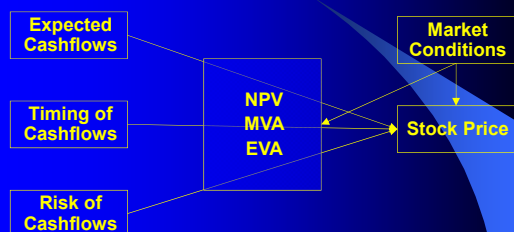
- ◆ The Use Of Financial Ratios
- ◆ Analyzing Liquidity
- ◆ Analyzing Activity
- ◆ Analyzing Debt
- ◆ Analyzing Profitability
- ◆ A Complete Ratio Analysis

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The Analysis of Financial Statements

- ◆ THE USE OF FINANCIAL RATIOS
 - Financial Ratio are used as a relative measure that facilitates the evaluation of efficiency or condition of a particular aspect of a firm's operations and status
 - Ratio Analysis involves methods of calculating and interpreting financial ratios in order to assess a firm's performance and status

Stock Price



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Financial Analysis

- Assessment of the firm's past, present and future financial conditions
- Done to find firm's financial strengths and weaknesses
- Primary Tools:
 - Financial Statements
 - Comparison of financial ratios to past, industry, sector and all firms

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Types of Ratio Comparisons

There are two types of ratio comparisons that can be made:

- ◆ Cross-Sectional Analysis
- ◆ Time-Series Analysis
 - Combined Analysis uses both types of analysis to assess a firm's trends versus its competitors or the industry

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Financial Statements

- Balance Sheet
- Income Statement
- Cashflow Statement
- Statement of Retained Earnings

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Sources of Data

- Annual reports
 - Via mail, SEC or company websites
- Published collections of data
 - e.g., Dun and Bradstreet or Robert Morris
- Investment sites on the web
 - Examples
 - <http://moneycentral.msn.com/investor>
 - <http://www.marketguide.com>

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The Main Idea

- Value for the firm comes from cashflows
- Cashflows can be calculated as:
 - $(Rev_t - Cost_t - Dep_t) \times (1 - \tau) + Dep_t$
—OR—
 - $(Rev_t - Cost_t) \times (1 - \tau) + \tau \times Dep_t$
—OR—
 - $Rev_t \times (1 - \tau) - Cost_t \times (1 - \tau) + \tau \times Dep_t$

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Review: Major Balance Sheet Items

<u>Assets</u>	<u>Liabilities and Equity</u>
<ul style="list-style-type: none"> • Current assets: <ul style="list-style-type: none"> – Cash & securities – Receivables – Inventories • Fixed assets: <ul style="list-style-type: none"> – Tangible assets – Intangible assets 	<ul style="list-style-type: none"> • Current liabilities: <ul style="list-style-type: none"> – Payables – Short-term debt • Long-term liabilities • Shareholders' equity

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An Example: Dell Abbreviated Balance Sheet

• Assets:	
– Current Assets:	\$7,681.00
– Non-Current Assets:	<u>\$3,790.00</u>
– Total Assets:	\$11,471.00
• Liabilities:	
– Current Liabilities:	\$5,192.00
– LT Debt & Other LT Liab.:	\$971.00
– Equity:	<u>\$5,308.00</u>
– Total Liab. and Equity:	\$11,471.00

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Review: Major Income Statement Items

- Gross Profit = Sales - Costs of Goods Sold
- EBITDA
= Gross Profit - Cash Operating Expenses
- EBIT = EBDIT - Depreciation - Amortization
- EBT = EBIT - Interest
- NI or EAT = EBT - Taxes
- Net Income is a primary determinant of the firm's cashflows and, thus, the value of the firm's shares

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An Example: Dell Abbreviated Income Statement

Sales	\$25,265.00
Costs of Goods Sold	<u>-\$19,891.00</u>
Gross Profit	\$5,374.00
Cash operating expense	<u>-\$2,761.00</u>
EBITDA	2,613.00
Depreciation & Amortization	<u>-\$156.00</u>
Other Income (Net)	<u>-\$6.00</u>
EBIT	\$2,451.00
Interest	<u>-\$0.00</u>
EBT	\$2,451.00
Income Taxes	<u>-\$785.00</u>
Special Income/Charges	<u>-\$194.00</u>
Net Income (EAT)	\$1,666.00

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Objectives of Ratio Analysis

- Standardize financial information for comparisons
- Evaluate current operations
- Compare performance with past performance
- Compare performance against other firms or industry standards
- Study the efficiency of operations
- Study the risk of operations



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Rationale Behind Ratio Analysis

- A firm has resources
- It converts resources into profits through
 - production of goods and services
 - sales of goods and services
- Ratios
 - Measure relationships between resources and financial flows
 - Show ways in which firm's situation deviates from
 - Its own past
 - Other firms
 - The industry
 - All firms-

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Interested Parties

Three sets of parties are interested in ratio analysis:

- ◆ Shareholders
- ◆ Creditors
- ◆ Management

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Groups of Financial Ratios

- ☞ Liquidity
- ☞ Activity
- ☞ Debt
- ☞ Profitability

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Types of Ratios

- **Financial Ratios:**
 - Liquidity Ratios
 - Assess ability to cover current obligations
 - Leverage Ratios
 - Assess ability to cover long term debt obligations
- **Operational Ratios:**
 - Activity (Turnover) Ratios
 - Assess amount of activity relative to amount of resources used
 - Profitability Ratios
 - Assess profits relative to amount of resources used
- **Valuation Ratios:**
 - Assess market price relative to assets or earnings

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Words of Caution Regarding Ratio Analysis

- ◆ A single ratio rarely tells enough to make a sound judgment.
- ◆ Financial statements used in ratio analysis must be from similar points in time.
- ◆ Audited financial statements are more reliable than unaudited statements.
- ◆ The financial data used to compute ratios must be developed in the same manner.
- ◆ Inflation can distort comparisons.

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Analyzing Liquidity

- ◆ Liquidity refers to the solvency of the firm's overall financial position, i.e. a "liquid firm" is one that can easily meet its short-term obligations as they come due.
- ◆ A second meaning includes the concept of converting an asset into cash with little or no loss in value.

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Three Important Liquidity Measures

Net Working Capital (NWC)

$$NWC = \text{Current Assets} - \text{Current Liabilities}$$

$$= -\text{fix asset} + \text{equities} + \text{longterm liabilities}$$

Current Ratio (CR)

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

Quick (Acid-Test) Ratio (QR)

$$QR = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

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Liquidity Ratio Examples: Dell

Current Ratio:

$$\text{Current Ratio} := \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$7,681.00}{\$5,192.00} = 1.48$$

Quick (Acid Test) Ratio:

$$\text{Acid Test Ratio} := \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}} = \frac{\$7,681.00 - \$391.00}{\$1,107,000} = 1.40$$

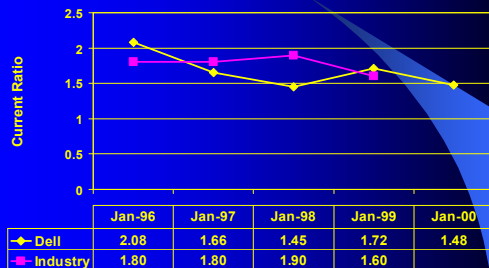
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Example

	(1)	(2)	(1)/(2)
Year End	Current Assets/Current Liab.	Current Ratio	
1994	\$550,000 / \$500,000	1.10	
1995	\$550,000 / \$600,000	.92	

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Ratio Comparison: Current Ratio



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Analyzing Debt

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- ◆ Debt is a true "double-edged" sword as it allows for the generation of profits with the use of other people's (creditors) money, but creates claims on earnings with a higher priority than those of the firm's owners.
- ◆ Financial Leverage is a term used to describe the magnification of risk and return resulting from the use of fixed-cost financing such as debt and preferred stock.

—Prof. Rietz

Measures of Debt

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- ◆ There are Two General Types of Debt Measures
 - Degree of Indebtedness
 - Ability to Service Debts

Four Important Debt Measures

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Debt Ratio (DR)

$$DR = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

Debt-Equity Ratio (DER)

$$DER = \frac{\text{Long-Term Debt}}{\text{Stockholders' Equity}}$$

Times Interest Earned Ratio (TIE)

$$TIE = \frac{\text{Earnings Before Interest \& Taxes (EBIT)}}{\text{Interest}}$$

Fixed Payment Coverage Ratio (FPC)

$$FPC = \frac{\text{Earnings Before Interest \& Taxes + Lease Payments}}{\text{Interest + Lease Payments + ((Principal Payments + Preferred Stock Dividends) \times [1 / (1 - I)])}}$$

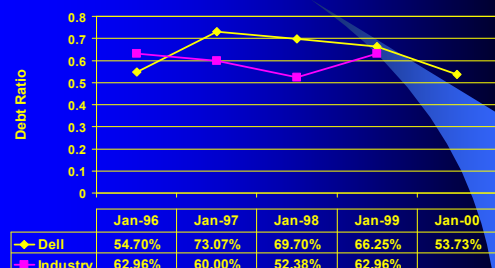
Leverage Ratio Examples: Dell

Debt Ratio:

$$\text{Debt Ratio} := \frac{\text{Total Liabilities}}{\text{Total Assets}} = \frac{\$6,163.00}{\$11,471.00} = 53.73\%$$

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Ratio Comparison: Debt Ratio



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Analyzing Profitability

- Profitability Measures assess the firm's ability to operate efficiently and are of concern to owners, creditors, and management
- A Common-Size Income Statement, which expresses each income statement item as a percentage of sales, allows for easy evaluation of the firm's profitability relative to sales.

Seven Basic Profitability

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

Operating Profit Margin (OPM) $OPM = \frac{\text{Operating Profits (EBIT)}}{\text{Sales}}$

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

Return on Total Assets (ROA) $ROA = \frac{\text{Net Profit After Taxes}}{\text{Total Assets}}$

Return On Equity (ROE) $ROE = \frac{\text{Net Profit After Taxes}}{\text{Stockholders' Equity}}$

Earnings Per Share (EPS) $EPS = \frac{\text{Earnings Available for Common Stockholders}}{\text{Number of Shares of Common Stock Outstanding}}$

Price/Earnings (P/E) Ratio $P/E = \frac{\text{Market Price Per Share of Common Stock}}{\text{Earnings Per Share}}$

Profitability Ratio Examples: Dell

- Return on Assets (ROA):**

$$ROA := \frac{\text{Net Income}}{\text{Total Assets}} = \frac{\$1,666.00}{\$11,471.00} = 14.52\%$$
- Return on Equity (ROE):**

$$ROE := \frac{\text{Net Income}}{\text{Total Common Equity}} = \frac{\$1,666.00}{\$5,308.00} = 31.39\%$$

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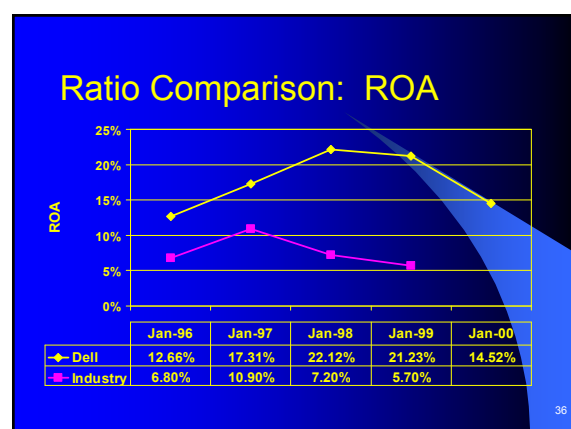
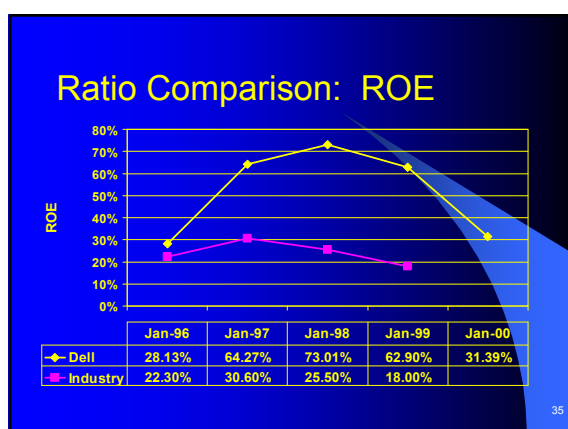
Profitability Ratio Examples: Dell

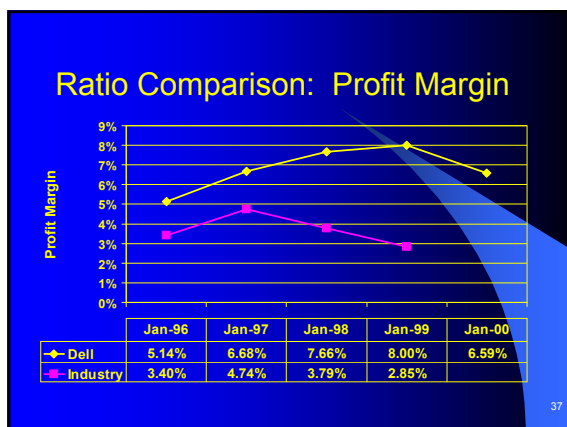
- Net Profit Margin:**

$$\text{Net Profit Margin} := \frac{\text{EBIT}}{\text{Sales}} = \frac{\$2,451.00}{\$25,265.00} = 9.70\%$$
- Retention Ratio**

$$\text{Retention Ratio } (\rho) := \frac{\text{EPS} - \text{Div}}{\text{EPS}} = \frac{\$0.66 - \$0}{\$0.66} = 100\%$$

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10 **Analyzing Activity**

◆ Activity is a more sophisticated analysis of a firm's liquidity, evaluating the speed with which certain accounts are converted into sales or cash; also measures a firm's efficiency

11 **Five Important Activity Measures**

Inventory Turnover (IT) $IT = \frac{\text{Cost of Goods Sold}}{\text{Inventory}}$

Average Collection Period (ACP) $ACP = \frac{\text{Accounts Receivable}}{\text{Annual Sales}/360}$

Average Payment Period (APP) $APP = \frac{\text{Accounts Payable}}{\text{Annual Purchases}/360}$

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

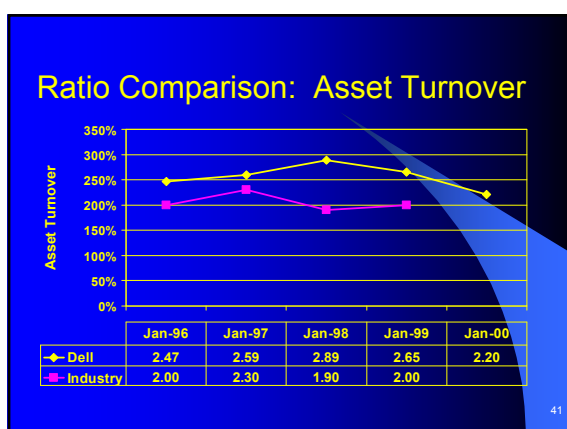
Total Asset Turnover (TAT) $TAT = \frac{\text{Sales}}{\text{Total Assets}}$

Activity (Turnover) Ratio Examples: Dell

- Total Asset Turnover Ratio:**

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{\$25,265.00}{\$11,471.00} = 2.20$$
- Inventory Turnover Ratio:**

$$\text{Inventory Turnover} = \frac{\text{Sales}}{\text{Inventory}} = \frac{\$25,265.00}{\$391.00} = 64.62$$



17 **A Complete Ratio Analysis**

◆ **DuPont System of Analysis**

- DuPont System of Analysis is an *integrative* approach used to *dissect* a firm's financial statements and assess its financial condition
- It ties together the income statement and balance sheet to determine two summary measures of profitability, namely ROA and ROE

18 *DuPont System of Analysis*

◆ The firm's return is broken into three components:

- A profitability measure (*net profit margin*)
- An efficiency measure (*total asset turnover*)
- A leverage measure (*financial leverage multiplier*)

The DuPont System

- Method to breakdown ROE into:
 - ROA and Equity Multiplier
- ROA is further broken down as:
 - Profit Margin and Asset Turnover
- Helps to identify sources of strength and weakness in current performance
- Helps to focus attention on value drivers

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The DuPont System

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The DuPont System

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Equity Multiplier} \\ &= \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}} \end{aligned}$$

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The DuPont System

$$\begin{aligned} \text{ROA} &= \text{Profit Margin} \times \text{Total Asset Turnover} \\ &= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \end{aligned}$$

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The DuPont System

$$\begin{aligned} \text{ROE} &= \text{Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier} \\ &= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}} \end{aligned}$$

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The DuPont System: Dell

$$\begin{aligned} \text{ROE} &= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}} \\ &= \text{Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier} \\ &= \text{ROA} \times \text{Equity Multiplier} \end{aligned}$$

$$\begin{aligned} \text{ROE} &= \frac{\$1,666.00}{\$25,265.00} \times \frac{\$25,265.00}{\$11,471.00} \times \frac{\$11,471.00}{\$5,308.00} \\ &= 0.0659 \times 2.2025 \times 2.1611 \\ &= 0.1452 \times 2.1611 \\ &= 31.39\% \end{aligned}$$

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A Note on Sustainable Growth and Stock Returns

- In the long run
 - Sustainable growth and long run capital gains (g) = ROE × p
- Recall the relationship between stock returns (r), capital gains (g) and forward dividend yields (D_1/P_0):
 - $r = g + D_1/P_0 = g + D_0(1+g)/P_0$
- Note: r & g must be quarterly if D is quarterly and annual if D is annual

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Example: Predicted Sustainable Growth for Dell

- | | |
|---|---|
| <ul style="list-style-type: none"> • Based on the most recent numbers: <ul style="list-style-type: none"> – ROE = 31.39% & p = 100% – $g = 0.3139 \times 1 = 31.39\%$ – $r = 0.3139 + 0/P = 31.39\%$ | <ul style="list-style-type: none"> • Based on 5 year averages: <ul style="list-style-type: none"> – ROE = 51.94% & p = 100% – $g = 0.5194 \times 1 = 51.94\%$ – $r = 0.3139 + 0/P = 51.94\%$ |
|---|---|

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Summary of Financial Ratios

- Ratios help to:
 - Evaluate performance
 - Structure analysis
 - Show the connection between activities and performance
- Benchmark with
 - Past for the company
 - Industry
- Ratios adjust for size differences

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Limitations of Ratio Analysis

- A firm's industry category is often difficult to identify
- Published industry averages are only guidelines
- Accounting practices differ across firms
- Sometimes difficult to interpret deviations in ratios
- Industry ratios may not be desirable targets
- Seasonality affects ratios

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Ratios and Forecasting

- Common stock valuation based on
 - Expected cashflows to stockholders
 - ROE and p are major determinants of cashflows to stockholders
- Ratios influence expectations by:
 - Showing where firm is now
 - Providing context for current performance
- Current information influences expectations by:
 - Showing developments that will alter future performance

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Summarizing All Ratios

- ◆ An approach that views all aspects of the firm's activities to isolate key areas of concern
- ◆ Comparisons are made to industry standards (*cross-sectional analysis*)
- ◆ Comparisons to the firm itself over time are also made (*time-series analysis*)

END SEE YOU NEXT WEEK

• **THANK FOR YOUR
SMILES**

• veerakij