

Chapter 3 Lecture - Working with Financial Statements

Chapter 3 Lecture - Working with Financial Statements



Learning Objectives

After studying this chapter, you should be able to:

LO 1 Standardize financial statements for comparison purposes.

LO 2 Compute and, more important, interpret some common ratios.

LO 3 Assess the determinants of a firm's profitability and growth.

LO 4 Identify and explain some of the problems and pitfalls in financial statement analysis.

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Standardized Financial Statements

- **Common-Size Balance Sheets**
 - All accounts = percent of total assets (%TA)
- **Common-Size Income Statements**
 - All line items = percent of sales or revenue (%SLS)
- **Standardized statements are useful for:**
 - Comparing financial information year-to-year
 - Comparing companies of different sizes, particularly within the same industry

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Prufrock Corporation Balance Sheets

PRUFROCK CORPORATION Balance Sheets as of December 31, 2015 and 2016 (\$ in millions)		
	2015	2016
Assets		
Current assets		
Cash	\$ 84	\$ 98
Accounts receivable	165	188
Inventory	393	422
Total	\$ 642	\$ 708
Fixed assets		
Net plant and equipment	\$2,731	\$2,880
Total assets	\$3,373	\$3,588
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	\$ 312	\$ 344
Notes payable	231	196
Total	\$ 543	\$ 540
Long-term debt	\$ 531	\$ 457
Owners' equity		
Common stock and paid-in surplus	\$ 500	\$ 550
Retained earnings	1,799	2,041
Total	\$2,299	\$2,591
Total liabilities and owners' equity	\$3,373	\$3,588

TABLE 3.1

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Prufrock Corporation Common-Size Balance Sheets

TABLE 3.2

PRUFROCK CORPORATION Common-Size Balance Sheets December 31, 2015 and 2016			
	2015	2016	Change
Assets			
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	11.7	11.8	+ .1
Total	19.0	19.7	+ .7
Fixed assets			
Net plant and equipment	81.0	80.3	-.7
Total assets	100.0%	100.0%	0%
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .3%
Notes payable	6.8	5.5	-1.4
Total	16.1	15.1	-1.0
Long-term debt	15.7	12.7	-3.0
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	53.3	56.9	+3.5
Total	68.2	72.2	+4.1
Total liabilities and owners' equity	100.0%	100.0%	0%

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Prufrock Corporation Income Statement

TABLE 3.3

PRUFROCK CORPORATION 2016 Income Statement (\$ in millions)	
Sales	\$2,311
Cost of goods sold	1,344
Depreciation	276
Earnings before interest and taxes	\$ 691
Interest paid	141
Taxable income	\$ 550
Taxes (34%)	187
Net income	\$ 363
Dividends	\$121
Addition to retained earnings	242

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Prufrock Corporation Common-Size Income Statement

PRUFROCK CORPORATION
Common-Size Income Statement
2016

TABLE 3.4

Sales	100.0%
Cost of goods sold	58.2
Depreciation	11.9
Earnings before interest and taxes	29.9
Interest paid	6.1
Taxable income	23.8
Taxes (34%)	8.1
Net income	15.7%
Dividends	5.2%
Addition to retained earnings	10.5

Tells us what happened to each dollar of sales

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Ratio Analysis

- Allow for better comparison through time or between companies
- Used both internally and externally
- For each ratio, ask yourself:
 - What the ratio is trying to measure
 - Why that information is important

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Categories of Financial Ratios

- **Liquidity ratios** or Short-term solvency
- **Financial leverage ratios** or Long-term solvency ratios
- **Asset management** or Turnover ratios
- **Profitability ratios**
- **Market value ratios**

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Common Financial Ratios

I. Short-term solvency, or liquidity, ratios	Days' sales in receivables = $\frac{365 \text{ days}}{\text{Receivables turnover}}$
Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$	Days' costs in payables = $\frac{365 \text{ days}}{\text{Payables turnover}}$
Quick ratio = $\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	Total asset turnover = $\frac{\text{Sales}}{\text{Total assets}}$
Cash ratio = $\frac{\text{Cash}}{\text{Current liabilities}}$	Capital intensity = $\frac{\text{Total assets}}{\text{Sales}}$
II. Long-term solvency, or financial leverage, ratios	IV. Profitability ratios
Total debt ratio = $\frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$	Profit margin = $\frac{\text{Net Income}}{\text{Sales}}$
Debt-equity ratio = $\frac{\text{Total debt}}{\text{Total equity}}$	Return on assets (ROA) = $\frac{\text{Net Income}}{\text{Total assets}}$
Equity multiplier = $\frac{\text{Total assets}}{\text{Total equity}}$	Return on equity (ROE) = $\frac{\text{Net Income}}{\text{Total equity}}$
Times interest earned ratio = $\frac{\text{EBIT}}{\text{Interest}}$	ROE = $\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$
Cash coverage ratio = $\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$	V. Market value ratios
III. Asset utilization, or turnover, ratios	Price-earnings ratio = $\frac{\text{Price per share}}{\text{Earnings per share}}$
Inventory turnover = $\frac{\text{Cost of goods sold}}{\text{Inventory}}$	Price-sales ratio = $\frac{\text{Price per share}}{\text{Sales per share}}$
Days' sales in inventory = $\frac{365 \text{ days}}{\text{Inventory turnover}}$	Market-to-book ratio = $\frac{\text{Market value per share}}{\text{Book value per share}}$
Receivables turnover = $\frac{\text{Sales}}{\text{Accounts receivable}}$	Market-to-book ratio = $\frac{\text{Market value per share}}{\text{Book value per share}}$
Payables turnover = $\frac{\text{Cost of goods sold}}{\text{Accounts payable}}$	EBITDA ratio = $\frac{\text{Enterprise value}}{\text{EBITDA}}$

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Liquidity Ratios

PRUFROCK Balance Sheet - 2016			
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
		Retained Earnings	\$ 2,041
Fixed Assets		Total	\$ 2,591
Net Plant & Equipment	\$ 2,880	Total Liabilities & Owners' Equity	\$ 3,588
Total Assets	\$ 3,588		

- **Current Ratio** = CA / CL
- 708 / 540 = 1.31 times
- **Quick Ratio** = (CA - Inventory) / CL
- "Acid Test"
- (708-422) / 540 = 0.53 times
- **Cash Ratio** = Cash / CL
- 98 / 540 = .18 times

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Financial Leverage Ratios

PRUFROCK Balance Sheet - 2016			
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
		Retained Earnings	\$ 2,041
Fixed Assets		Total	\$ 2,591
Net Plant & Equipment	\$ 2,880	Total Liabilities & Owners' Equity	\$ 3,588
Total Assets	\$ 3,588		

- **Total Debt Ratio** = (TA - TE) / TA
- (3,588 - 2,591) / 3,588 = 0.28 times
- **Debt/Equity** = TD / TE
- (0.28 / 0.72) = 0.38 times
- **Equity Multiplier** = TA/TE = 1 + D/E
- (\$1 / 0.72) = (1 + 0.38) = 1.38

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Financial Leverage Ratios

PRUFROCK Income Statement - 2016	
Sales	\$ 2,311
COGS	\$ 1,344
Depreciation	\$ 276
EBIT	\$ 691
Interest	\$ 141
Taxable Income	\$ 550
Taxes	\$ 187
Net Income	\$ 363
Dividends	\$ 121
Addition to RE	\$ 242

- **Times Interest Earned** = EBIT / Interest
– 691 / 141 = 4.9 times
- **Cash Coverage** = (EBIT + Depreciation) / Interest
– (691 + 276) / 141 = 6.9 times

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Asset Management: Inventory Ratios

PRUFROCK Balance Sheet - 2016		PRUFROCK Income Statement - 2016	
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
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Fixed Assets		Total	\$ 2,591
Net Plant & Equipment	\$ 2,880	Total Liabilities & Owners' Equity	\$ 3,588
Total Assets	\$ 3,588		

- **Inventory Turnover** = COGS / Inventory
– 1,344 / 422 = 3.2 times
- **Days' Sales in Inventory** = 365 / Inventory Turnover
– 365 / 3.2 = 115 days

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Asset Management: Receivables Ratios

PRUFROCK Balance Sheet - 2016		PRUFROCK Income Statement - 2016	
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
		Retained Earnings	\$ 2,041
Fixed Assets		Total	\$ 2,591
Net Plant & Equipment	\$ 2,880	Total Liabilities & Owners' Equity	\$ 3,588
Total Assets	\$ 3,588		

- **Receivables Turnover** = Sales / AR
– 2,311 / 188 = 12.3 times
- **Days' Sales in Receivables** = 365 / Receivables Turnover
– 365 / 12.3 = 30 days

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Asset Management: Payables Ratios

PRUFROCK Balance Sheet - 2016		PRUFROCK Income Statement - 2016	
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
		Retained Earnings	\$ 2,041
Fixed Assets		Total	\$ 2,591
Net Plant & Equipment	\$ 2,880	Total Liabilities & Owners' Equity	\$ 3,588
Total Assets	\$ 3,588		

- **Payables Turnover** = COGS / AP
– 1,344 / 344 = 3.9 times
- **Days' Costs in Payables** = 365 / Payables Turnover
– 365 / 3.9 = 94 days

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Asset Management: Asset Turnover Ratios

PRUFROCK Balance Sheet - 2016		PRUFROCK Income Statement - 2016	
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
Fixed Assets		Retained Earnings	\$ 2,041
Net Plant & Equipment	\$ 2,880	Total	\$ 2,591
Total Assets	\$ 3,588	Total Liabilities & Owners' Equity	\$ 3,588
		Sales	\$ 2,311
		COGS	\$ 1,344
		Depreciation	\$ 276
		EBIT	\$ 691
		Interest	\$ 141
		Taxable Income	\$ 550
		Taxes	\$ 187
		Net Income	\$ 363
		Dividends	\$ 121
		Addition to RE	\$ 242

- **Total Asset Turnover** = Sales / Total Assets
– 2,311 / 3,588 = 0.64 times
- **Capital Intensity Ratio** = 1/TAT
– 1 / 0.64 = 1.56

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Profitability Measures

PRUFROCK Balance Sheet - 2016		PRUFROCK Income Statement - 2016	
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	\$ 98	Accounts Payable	\$ 344
Accounts Receivable	\$ 188	Notes Payable	\$ 196
Inventory	\$ 422	Total	\$ 540
Total	\$ 708	Long term debt	\$ 457
		Owners' Equity	
		Common Stock and paid in surplus	\$ 550
Fixed Assets		Retained Earnings	\$ 2,041
Net Plant & Equipment	\$ 2,880	Total	\$ 2,591
Total Assets	\$ 3,588	Total Liabilities & Owners' Equity	\$ 3,588
		Sales	\$ 2,311
		COGS	\$ 1,344
		Depreciation	\$ 276
		EBIT	\$ 691
		Interest	\$ 141
		Taxable Income	\$ 550
		Taxes	\$ 187
		Net Income	\$ 363
		Dividends	\$ 121
		Addition to RE	\$ 242

- **Profit Margin** = NI / Sales
= 363 / 2,311 = 15.70%
- **Return on Assets (ROA)** = NI / TA
= 363 / 3,588 = 10.12%
- **Return on Equity (ROE)** = NI / TE
= 363 / 2,591 = 14.01%

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Market Value Measures

- **Market Price** = \$88 per share = PPS
- **Shares outstanding** = 33 million
- **Earnings per Share** = EPS = 363 / 33 = \$11
- **PE ratio** = PPS / EPS
– \$88 / \$11 = 8 times
- **Price/Sales ratio** = PPS/Sales per share
– \$88 / (\$2,311 / 33) = 1.26 times
- **Market-to-book ratio** = PPS / Book value per share
– **Book value per share** = Total Equity/shares outstanding
= \$2,591 / 33 = \$78.52
– **Market-to-Book** = \$88 / 78.52 = 1.12 times

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Market Value Measures

- **Enterprise value** = Total market value of the stock + Book value of all liabilities – Cash
$$EV = (\$88 \times 33) + (3,588 - 2,591) - (98) = 3,803$$
- **EBITDA ratio** = Enterprise value / EBITDA
 - **EBITDA** = EBIT + Depreciation & Amortization
= (691 + 276) = 967
 - **EBITDA ratio** = (3,803 / 967) = 3.93 times

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Prufrock Ratios

PRUFROCK RECAP			
Liquidity Ratios		Financial Leverage Ratios	
Current Ratio	1.31	Total Debt Ratio	0.28
Quick Ratio	0.53	Debt to Equity	0.38
Cash Ratio	0.18	Equity Multiplier	1.38
Asset Management Ratios		Profitability Measures	
Inventory Turnover	3.20	Times Interest Earned	4.9
Days' Sales in Inventory	114	Cash Coverage	6.9
Receivables Turnover	12.30	Profit Margin	15.70%
Days' Sales in Receivables	30	ROA	10.10%
Total Asset Turnover	0.64	ROE	14.00%
Capital Intensity Ratio			
Market Value Measures			
Market Price	\$88.00		
Shares Outstanding	33 m		
EPS	\$11.00	Price/Sales Ratio	1.26
PE Ratio	8.0	Book value per share	\$78.52
Market to Book	1.12	EBITDA Ratio	3.93

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Financial Information Example for 2014 for Lowe's and Home Depot (millions of dollars)

	Lowe's	Home Depot	TABLE 3.6
Sales	\$56,226	\$83,176	Financial information from 2014 for Lowe's and Home Depot (numbers in millions except for per-share data)
Net Income	2,698	6,345	
Current assets	10,080	15,302	
Current liabilities	9,348	7,488	
Total assets	31,287	39,946	
Total debt	21,589	30,624	
Total equity	9,968	9,322	
Price per share	67.76	104.43	
Book value per share	10.78	7.28	
Earnings per share	2.92	4.96	
Current ratio	1.08	2.04	
Debt-equity ratio	2.19	3.29	
Total asset turnover	1.80	2.08	
Profit margin	4.80%	7.63%	
ROE	27.07%	68.06%	
ROA	8.48%	15.88%	
Market-to-book ratio	6.29	14.34	
Price-earnings ratio	23.23	21.07	

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The DuPont Identity

- Return on Equity = Net Income / Total Equity
= Basic Formula
- ROE = PM * TAT * EM = DuPont Identity
 - PM (profit margin) = Net Income / Sales
 - TAT (Total asset turnover) = Sales / Total Assets
 - EM (Equity Multiplier) = Total Assets / Total Equity

$$ROE = \left(\frac{NI}{Sales} \right) \times \left(\frac{Sales}{TA} \right) \times \left(\frac{TA}{TE} \right) = \frac{NetIncome}{TotalEquity}$$

Profit Margin Asset Use Leverage = ROE

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Using the DuPont Identity

- ROE = PM x TAT x EM
 - Profit margin
 - Measures firm's operating efficiency
 - How well does it control costs
 - Total asset turnover
 - Measures the firm's asset use efficiency
 - How well does it manage its assets
 - Equity multiplier
 - Measures the firm's financial leverage
 - EM = TA / TE = 1 + D/E ratio

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Prufrock's DuPont Identity

PRUFROCK RECAP			
Liquidity Ratios		Financial Leverage Ratios	
Current Ratio	1.31	Total Debt Ratio	0.28
Quick Ratio	0.53	Debt to Equity	0.38
Cash Ratio	0.18	Equity Multiplier	1.38
Asset Management Ratios		Profitability Measures	
Inventory Turnover	3.20	Times Interest Earned	4.9
Days' Sales in Inventory	114	Cash Coverage	6.9
Receivables Turnover	12.30	Profit Margin	15.70%
Days' Sales in Receivables	30	ROA	10.10%
Total Asset Turnover	0.64	ROE	14.00%
Capital Intensity Ratio			
Market Value Measures			
Market Price	\$88.00	Price/Sales Ratio	1.26
Shares Outstanding	33 m	Book value per share	\$78.52
EPS	\$11.00	EBITDA Ratio	3.93
PE Ratio	8.0		
Market to Book	1.12		

- $ROE = PM \times TAT \times EM$
 - $PM = 15.7\%$
 - $TAT = 0.64$
 - $EM = 1.39$
- $ROE = 0.157 \times 0.64 \times 1.39 = 14\%$

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Payout and Retention Ratios

- Dividend payout ratio = $\frac{\text{Cash Dividends}}{\text{Net Income}}$
- Retention ratio or plowback ratio = $\frac{\text{Addition to Retained Earnings}}{\text{Net Income}}$

Dividend payout ratio ("1 - b")
Retention ratio ("b")

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Payout and Retention Ratios

PRUFROCK Balance Sheet - 2016			PRUFROCK Income Statement - 2016	
ASSETS			Income Statement - 2016	
Current Assets			Sales	\$ 2,311
Cash	\$ 98	Liabilities & Owners Equity	COGS	\$ 1,344
Accounts Receivable	\$ 188	Current Liabilities	Depreciation	\$ 276
Inventory	\$ 422	Accounts Payable	EBIT	\$ 691
Total	\$ 708	Notes Payable	Interest	\$ 141
		Total	Taxable Income	\$ 550
		Long term debt	Taxes	\$ 187
		Owners' Equity	Net Income	\$ 363
		Common Stock and paid in surplus		
		Retained Earnings	Dividends	\$ 121
Fixed Assets		Total	Addition to RE	\$ 242
Net Plant & Equipment	\$ 2,880	Total		
Total Assets	\$ 3,588	Total Liabilities & Owners' Equity		

- Dividend payout ratio ("1 - b") = Cash dividends / Net income = $(DIV / NI) = 121 / 363 = 33.3\%$
- Retention ratio ("b") = $(NI - DIV) / NI$ = Addition to Retained Earnings / Net income = $\$242 / 363 = 66.7\%$

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Determinants of Growth

- Profit margin - operating efficiency
- Total asset turnover - asset use efficiency
- Financial leverage - choice of optimal debt ratio
- Dividend policy - choice of how much to pay to shareholders versus reinvesting in the firm

Yahoo!						TABLE 3.7 DuPont analysis for Yahoo! and Google
Year	ROE	=	Profit margin	x	Total asset turnover	
2014	.4%	=	3.1%	x	.075	x 1.60
2013	4.5%	=	12.6%	x	.279	x 1.29
2012	3.9%	=	11.4%	x	.292	x 1.17

Google						
Year	ROE	=	Profit margin	x	Total asset turnover	
2014	13.8%	=	21.9%	x	.503	x 1.25
2013	15.3%	=	24.0%	x	.501	x 1.27
2012	16.1%	=	25.1%	x	.491	x 1.31

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Why Evaluate Financial Statements?

- **Internal uses**
 - Performance evaluation
 - compensation and comparison between divisions
 - Planning for the future
 - guide in estimating future cash flows
- **External uses**
 - Creditors
 - Suppliers
 - Customers
 - Stockholders

Benchmarking

- Ratios need to be compared to something
- **Time-Trend Analysis**
 - How the firm's performance is changing through time
 - Internal and external uses
- **Peer Group Analysis**
 - Compare to similar companies or within industries
 - SIC and NAICS codes

<http://siccode.com/en/>

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Problems with Financial Analysis

- **Conglomerates**
 - No readily available comparables
- **Global competitors**
- **Different accounting procedures**
- **Different fiscal year ends**
- **Differences in capital structure**
- **Seasonal variations and one-time events**

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Example: Work the Web

- The Internet makes ratio analysis much easier than it has been in the past
- Click on the Web surfer to go to www.reuters.com or <https://finance.yahoo.com/> or <https://www.investing.com/equities/>
 - Choose a company and enter its ticker symbol
 - Click on “Financial Results” and “Key Ratios” to compare the firm to its industry and the S&P 500 for various ratio categories
 - Change the ratio category using the links to the left of the chart.

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Limitations of Financial Statement Analysis

Analysts should look beyond the ratios.

