Chapter 14

Financial Analysis and Long-Term Planning



- LO 14.1 Describe what is meant by financial statement analysis and ratio analysis.
- LO 14.2 Explain, compute, and interpret liquidity ratios.
- LO 14.3 Explain, compute, and interpret asset management ratios.
- LO 14.4 Explain, compute, and interpret financial leverage ratios.
- LO 14.5 Explain, compute, and interpret profitability ratios.
- LO 14.6 Explain, compute, and interpret market value ratios and the quality of a firm's financial statements.

Learning Objectives

- LO 14.7 Describe what is meant by DuPont analysis and explain its major components.
- LO 14.8 Describe the link between asset investment requirements and sales growth and compute a firm's external financing needs using the percentage of sales technique.
- LO 14.9 Illustrate the cost-volume-profit analysis concept.
- LO 14.10 Compute a firm's degree of operating leverage and explain how it is affected by fixed operating costs.

LO 14.1 Financial Statement Analysis

- Why?
- Reflects effect of economic and competitive environment
- Internal uses by management
- External uses
 - Investors
 - Suppliers
 - Lenders

Ratio Analysis

- Absolute numbers versus ratios
 - 2018: ExxonMobil earns nearly \$21 Billion net income—a lot of money?
 - But that is a profit of less than 7.5 cents for every dollar of sales (net profit margin = net income / sales)
 - Compare that to Facebook: 2018 profits of \$22.1 Billion...but nearly 40 cents of profit per dollar of sales
 - Ratios control for "size" of the firm

Ratio Analysis

- Types of ratio analysis
 - trend or time series
 - Compute ratios each year to see if they rise, fall, or are stable
 - cross-sectional
 - Compare firm A and Firm B at a point in time
 - industry average
 - Compare Firm to an average of ratios of firms in its industry

Ratio Analysis Difficulties

- GAAP (generally accepted accounting principles)
- Multiproduct firms and other differences
 - Is Coca-Cola (soft drinks) comparable to PepsiCo (Pepsi, Frito-Lay, Ruffles, Quaker Oats, and other foods)?
- Within same industry, ratio
 characteristics may differ between
 large/small, domestic/global firms
- Ratios may be defined differently by various sources
 - Profits—pre-tax or after-tax?
 - Does "debt" include all liabilities or only long-term liabilities?

Ratio Analysis

- Focus on different ratios depends on user:
 - Bank loan officer
 - Long-term lender/bondholder
 - Equity investor

Types of Financial Ratios

- Liquidity
- Asset Management
- Financial Leverage
- Profitability
- Market Value

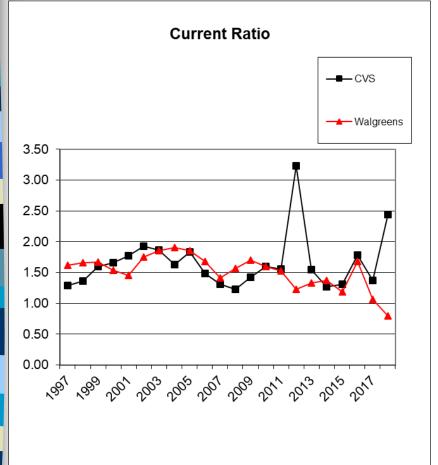
LO 14.2 Liquidity Ratios

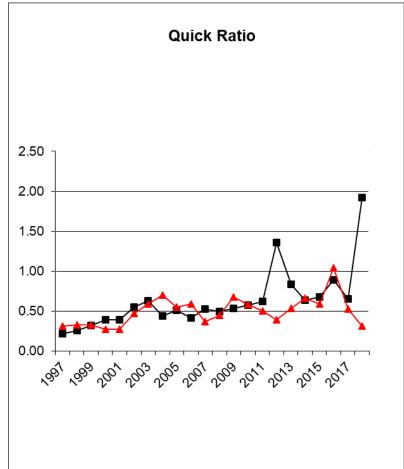
- The less liquid a firm, the greater the risk of insolvency or default the firm has. Because debt obligations are paid with cash, the firm's cash flows ultimately determine solvency.
- Liquidity ratios indicate the ability to meet short-term obligations to creditors as they mature or come due.

Liquidity Ratios

- Current ratio = <u>Current Assets</u>
 Current Liabilities
- Quick or acid-test ratio = (Cash + Accts. Receivable) Current Liabilities
- Average payment period = Accts Payable / (COGS/365)

Current vs Quick Ratio: WBA vs CVS





LO 14.3 Asset Management

- Asset management ratios indicate the extent to which assets are turned over or used to support sales.
- These are sometimes referred to as activity or utilization ratios.
- Each ratio in this category relates financial performance on the income statement with items on the balance sheet.

Asset Management

- Total Asset Turnover (TATO)
 - = Net Sales / Total Assets

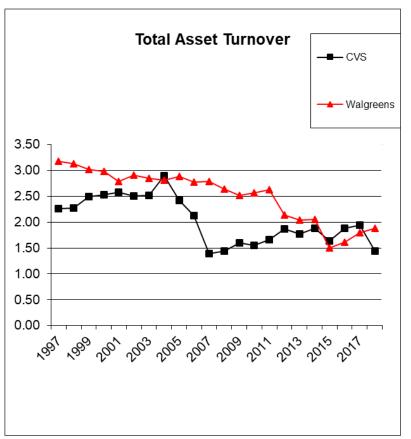
- Fixed Asset Turnover
 - = Net Sales / Fixed Assets

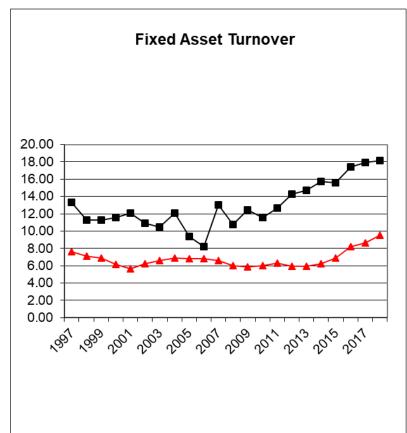
Asset Management Ratios

- Average collection period
 - = Accts Receivable / (Net Sales/365)

Inventory Turnover =
Cost of goods sold
Inventory

TATO vs FATO: WBA vs CVS





LO 14.4 Financial Leverage

Indicate the extent to which borrowed or debt funds are used to finance assets as well as the ability of the firm to meet its debt payment obligations.

Financial Leverage

- Total Debt to Total Assets
 - = Total Liabilities / Total Assets
- Total Debt to Equity
 - = Total Liabilities / Stockholder's Equity (SE)
- Equity Multiplier = Total Assets / SE

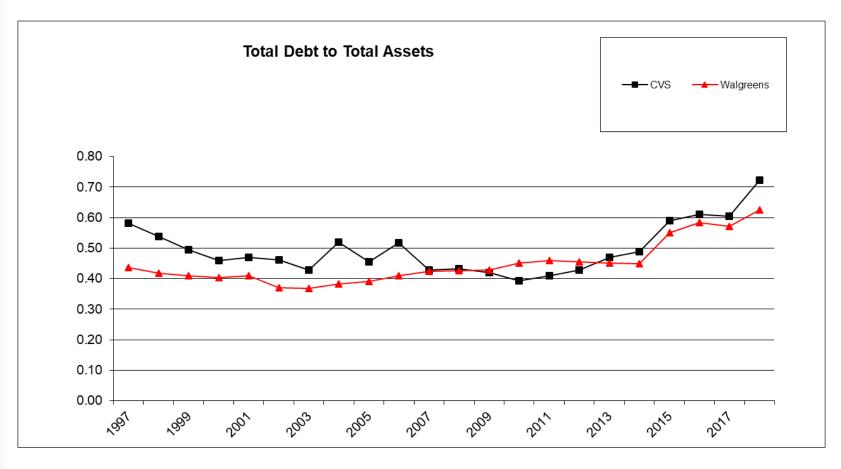
Financial Leverage (Continued)

- Interest Coverage
 - = EBIT / Interest expense
- Fixed Charge Coverage = Earnings before Fixed Charges

Before-tax Fixed Charges

Fixed Charges: interest, rent, lease, sinking fund payments, etc.

Total Debt to Total Assets: WBA vs CVS



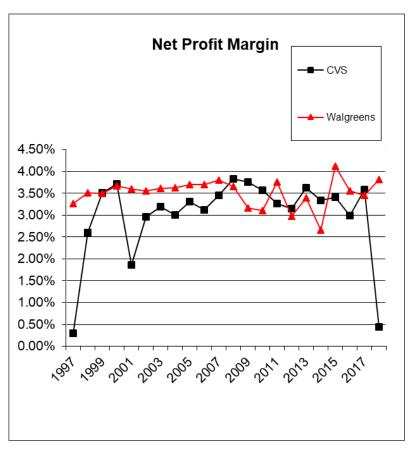
LO 14.5 Profitability Ratios

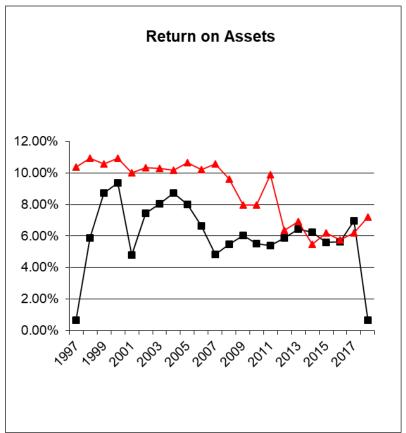
- Profitability ratios indicate the firm's ability to generate returns on its sales, assets, and equity.
- Measure the pennies earned on each dollar of sales (net profit margin), dollar of assets (return on assets), and stockholders' equity (return on equity)

Profitability

- Operating Profit Margin= EBIT / Net Sales
- Net Profit Margin
 = Net Income / Net Sales
- Operating Return on Assets= EBIT / Total Assets
- Return on Assets (ROA)Net Income / Total Assets
- Return on Equity (ROE)Net Income / Stockholder's Equity

Net Profit Margin vs ROA: WBA vs CVS





LO 14.6 Market Value Ratios

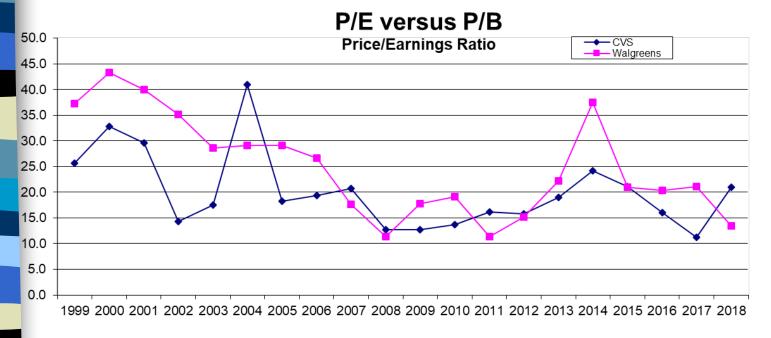
Indicate the willingness of investors to value a firm in the marketplace relative to financial statement values.

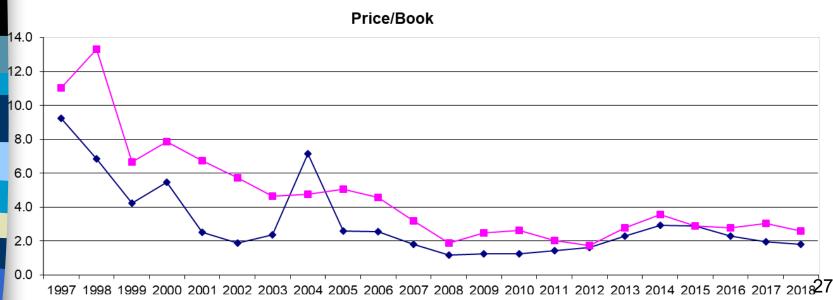
Market Value Ratios

- Price / earnings (P/E) ratio
 - Equals stock price / earnings per share

- Price / book ratio
 - Equals stock price / book value per share
 - Book value is usually measured by stockholders' equity

P/E vs P/B: WBA vs CVS







- Quality financial statements reflect the firm's true economic condition
- Quality Income Statement
 - Repeatable revenues
 - Lack of one-time charges or gains
- Quality Balance Sheet
 - Marketable inventory
 - Not at debt capacity
 - Market value of firm's assets exceed their book values

Ratios and Puzzles

- Examine ratios to determine a firm's strengths and weaknesses
- Dig deeper to discover cause of disappointing or deteriorating ratios
 - Ask "why?" has a ratio risen or fallen in value.

LO 14.7 DuPont Analysis

- Technique of breaking return on assets (ROA) and return on equity (ROE) into other component ratios.
- These component ratios can, in turn, be broken into their constituent parts for analysis.

DuPont Method

- ROA = profit margin x TA turnover
 NI / TA = NI/Sales x Sales/TA
- Indicates there are two ways to earn a given level of ROA:

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Low PM x High TATO

1% x 10 = 10% ROA

(grocery store)

High PM x Low TATO

10% x 1 = 10% ROA

(jewelry store)
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More DuPont analysis...

ROE = ROA x equity multiplier
NI / SE = (NI / TA) x (TA / equity)
Breaking down ROA into its parts:

Net income x Sales x Assets
Sales Assets Equity

Analyzing ROE

- ROE can change over time or differ across firms because of differing:
 - profit margins
 - total asset turnover
 - financial leverage
 - some combination of these three reasons

DuPont Analysis: WBA

	Net profit margin: <u>NET</u> <u>INCOME</u> X SALES	Total asset turnover: SALES TOTAL X ASSETS	Equity multiplier: TOTAL ASSETS = EQUITY	Return on Equity: <u>NET</u> INCOME* EQUITY
2015	4.11%	1.50	2.23	13.79%
2016	3.56%	1.61	2.40	13.78%
2017	3.45%	1.79	2.33	14.42%
2018	3.82%	1.88	2.66	19.13%

LO 14.8 Long-Term Financial Planning

- Failing to plan is planning to fail
- Future growth/asset needs
- Future financing arrangements

Percent of Sales Technique

ASSETS		PERCENT OF SALES (\$700,000)
Cash & marketable sec	. \$ 25,000	3.6%
Accounts receivable	100,000	14.3
Inventories	<u>125,000</u>	<u>17.8</u>
Total current assets	250,000	35.7
Net plant & equipment	200,000	28.6
Land	<u>50,000</u>	<u>7.1</u>
Total fixed assets	<u>250,000</u>	<u>35.7</u>
Total assets	\$500,000	71.4 ³⁶

Percent of Sales

LIABILITES AND	DOLLAR	PERCENT
EQUITY	AMOUNT	OF SALES (\$700,000)
Accounts payable	\$ 78,000	11.1%
Notes payable	34,000	4.9
Accrued liabilities	30,000	<u>4.3</u>
Total current liabilities	142,000	20.3
Long-term debt	<u>140,000</u>	<u>20.0</u>
Total liabilities	282,000	40.3
Total stockhldrs' equity	<u>218,000</u>	<u>31.1</u>
Total liabilities & equity	\$500,000	71.4 37

Using this information to forecast financing needs

Sales forecast: from \$700,000 to \$770,000

Forecast asset needs

$$\Delta TA = \Delta Sales x (TA percent of sales)$$

$$= $70,000 \times 0.714 = $49,980$$

Financing needs

$$\Delta TA = \Delta (TL + SE) = $49,980$$

Getting the funds...

Needed financing can be raised from

- internal sources
- external sources

Internally generated funds

Assume profit margin is 8% and the firm pays 50% of its profits as dividends

Forecasted net income

- = sales forecast x profit margin
- $= $770,000 \times 0.08 = $61,600$

Addition to retained earnings

- = net income forecast dividends
- =\$61,600 0.50 (\$61,600) = \$30,800

Externally generated financing

- Spontaneous financing
 - -Accounts payable 11.1% of Δ sales
 - -Accruals 4.3% of Δ sales

Spontaneous financing

- $= (0.111 + 0.043) \times (\$70,000)$
- $= (0.154) \times (\$70,000)$
- = \$10,780

External financing needs

External financing needs

- = ΔTA ΔRE spontaneous financing
- =\$49,980 \$30,800 \$10,780
- = \$8,400

We estimate the firm will need to raise \$8,400 over the coming year

LO 14.9 Cost-Volume-Profit Analysis

EBIT (or operating income) equals: Sales (price x Qty)

less: variable costs (VC x Qty)

less: fixed costs (FC)

= (Price x Qty) - (VC x Qty) - FC

Operating Profit Estimates

Given a unit sales or quantity estimate, we can estimate operating profit,

EBIT = (Price x Qty) - (VC x Qty) - FC

- A special case: Breakeven
- EBIT = 0 = (Price x Qty) (VC x Qty) FC
- Qty_{BE} = <u>Fixed Costs</u> (Price - VC)

Breakeven and the Contribution Margin

- Qty_{BE} = <u>Fixed Costs</u>
 (Price VC)
- **Contribution margin = price VC**
- Contribution margin: \$ contribution of each unit sold toward covering the fixed costs.
- If price = \$7 and VC = \$4, then \$3 of each unit sold helps to cover fixed costs
- If fixed costs are \$15,000, then breakeven is \$15,000/\$3 = 5,000 units

LO 14.10 Fixed Costs and Operating Leverage

Fixed operating costs result in a larger percentage change in EBIT for a given percentage change in sales

Net sales \$700,000

Less: variable costs (60% of sales) 420,000

Less: fixed costs 200,000

Earnings before interest

and taxes \$80,000



<u>-10%</u> <u>+10%</u>

Net sales \$630,000 \$770,000

Less: variable costs

(60% of sales) 378,000 462,000

Less: fixed costs 200,000 200,000

EBIT \$ 52,000 \$108,000

Percent change

in EBIT: -35% +35%

What happened?

- A 10% change in sales is magnified or levered into a 35% change in EBIT
- Degree of operating leverage (DOL) =(% change in EBIT / % change in sales)
- = 35% / 10% = 3.5

Another way of finding DOL

Net sales \$700,000

Less: variable costs (60% of sales) 420,000

Less: fixed costs 200,000

Earnings before interest and taxes

\$80,000

DOL =

sales - variable costs

sales - variable costs - fixed costs

= (700 - 420) / (700 - 420 - 200) = 3.5

As fixed costs rise, the leverage effect rises: use FC = \$250,000

PERCENT CHANGE IN SALES

	–10%	base case	+10%
Net sales	\$630,000	\$700,000	\$770,000
Less: VC (6	0%		
of sales)	378 000	420 000	462 000

of sales)	378,000	420,000	462,000
Less: FC	250,000	250,000	250,000
EBIT	\$ 2,000	\$ 30,000	\$ 58,000

EBIT % change

from base case –93.3% +93.3%

Degree of operating leverage (DOL) =

(% change in EBIT / % change in sales)

= 93.3% / 10% = 9.33

Using DOL

- Given DOL, we can estimate the change in operating income for a given change in sales
- DOL = (% change EBIT / % change sales)
- → % change in EBIT = % change in sales x DOL

Example

Going back to our base case:

Net sales \$700,000

Less: variable costs (60% of sales) 420,000

Less: fixed costs 200,000

Earnings before interest

and taxes

\$80,000

Problem: Forecast EBIT if sales are expected to rise 10 percent

Forecasting EBIT

- Sales are expected to rise 10 percent
- Current EBIT = \$80,000
- DOL = 3.5

%change in EBIT =

% change in sales x DOL

% change in EBIT = $10\% \times 3.5 = 35\%$

EBIT estimate = \$80,000 + 0.35(\$80,000)

EBIT estimate = \$108,000

Questions?