

CHAPTER 18

Financial Statement Analysis

Chapter Overview

This chapter is an extensive study of the three elements of financial statement analysis—horizontal, vertical, and ratio analysis. The chapter explains the needs of the different users—managers, owners, investors, and creditors—and how financial statement analysis can be useful in analyzing liquidity, solvency, profitability, future returns, and risk.

First, horizontal analysis, including both dollar changes and percentage changes, is explained and illustrated with a comparative income statement and balance sheet. Trend percentages, a type of horizontal analysis, are explained and computed. Vertical analysis is discussed next, and comparative financial statements showing vertical analysis are presented. Common-size statements, a form of vertical analysis, are also presented along with a discussion of the usefulness of benchmarking and industry comparisons.

The next part of the chapter emphasizes ratio analysis and how ratios are used to help make business decisions. Ratios are divided into these main categories:

1. Measuring the ability to pay current liabilities (working capital, current ratio, and acid-test ratio)
2. Measuring the ability to sell inventory and collect receivables (inventory turnover, accounts receivable turnover, and days' sales in receivables ratio)
3. Measuring the ability to pay long-term debt (debt ratio and times-interest-earned ratio)
4. Measuring profitability (rate of return on net sales, rate of return on total assets, rate of return on common shareholders' equity, and earnings per share)
5. Analyzing shares as an investment (price/earnings ratio, dividend yield, and book value per common share)

The chapter continues with a discussion of the limitations of financial analysis, nonfinancial data, and “red flags” and their implication for financial statement analysis. A description of the impact of international financial reporting standards (IFRS) on financial statement analysis concludes the chapter.

Try It! questions appear at the end of each Learning Objective for students to test their understanding of the Learning Objective just completed. The answers appear at the end of the chapter and on MyLab Accounting.

Students should be directed to MyLab for extra practice. Also included on MyLab are Excel templates for Exercises 18-1, 18-5, 18-8, Problem 18-7A and 18-7B.

The **Assignment Grid** recommends “Pre-Test” problems in MyLab that can be assigned before a test or exam to ensure students understand the topics, as well as “Post-Test” problems that students can complete after a test or exam to check understanding before moving on.

Connecting Learning Objectives and Key Questions

	Learning Objective	Key Question
1	Perform a horizontal analysis of financial statements	How do we compare several years of financial information?
2	Perform a vertical analysis of financial statements	What is a vertical analysis, and how do we perform one?
3	Prepare and use common-size financial statements	What are common-size financial statements, and how do we use them?
4	Compute the standard financial ratios	How do we compute standard financial ratios, and what do they mean?
5	Describe the impact of IFRS on financial statement analysis	What is the impact of IFRS on financial statement analysis?

Suggested Priority of Chapter Topics

Must cover

- Horizontal analysis
- Vertical analysis
- Common-size statements
- Using ratios used to make decisions
- Limitations of financial analysis

Recommended

- Investor decisions
- Impact of IFRS on financial statement analysis

Chapter Outline

An Introduction to Financial Statement Analysis:

- A. To make informed decisions about financial statements, managers, investors, and lenders must be able to analyze data. The Spin Master vignette illustrates how managers rely on accounting information in making business decisions.
- B. Financial statement analysis involves not only the use of financial statements, but also information from the annual report, including management's discussion and analysis (MD&A) of the financial results, the auditor's report, and the comparative financial data for a series of years. Exhibit 18-1 shows financial data from Spin Master's 2016 Annual Report.
- C. The **objectives of financial statement analysis** differ for investors and creditors.
 - 1. Creditors are interested in **short-term liquidity** and **long-term solvency**.
 - 2. Investors are concerned with profitability, dividends, and future share prices.
 - 3. Both groups use financial statement analysis to predict future returns and evaluate risks.

Learning Objective 1: Perform a horizontal analysis of financial statements

(How do we compare several years of financial information?)

- A. **Horizontal analysis** is a study of percentage changes in comparative statements. Exhibits 18-2 and 18-3 show horizontal analysis on the income statement and balance sheet, respectively.
 - 1. Horizontal analysis uses two financial statements (for example, two year-end statements).
 - a. The **dollar change** (increase or decrease) from one period to the next is calculated.
 - b. Then the **percentage change** is calculated by dividing the dollar change by the earlier-year amount.
 - 2. This method reports both dollar and percentage changes on the statements.
- B. **Trend percentages** are a form of horizontal analysis. They show the trend in a particular financial statement item (such as net income) over a period of years.
 - 1. Select a number of years in order to gain a realistic view of where the company is headed.
 - 2. Select a *base year* (the earliest year) and compare each year to the base year.
 - 3. Divide each year's dollar amount by the base year dollar amount to calculate a percentage.
 - 4. It is often useful to study several trend percentages together; for example, net sales, cost of goods sold, and gross margin.

Teaching Tip

Work through the calculations and emphasize the differences in the horizontal analyses reported in Exhibits 18-2 and 18-3.

Learning Objective 2: Perform a vertical analysis of financial statements

(What is a vertical analysis, and how do we perform one?)

- A. **Vertical analysis** shows the relationship of each financial statement item to some total on the financial statement. Exhibits 18-4 and 18-5 illustrate vertical analysis on the income statement and balance sheet, respectively.
- B. On the income statement, *each item is expressed as a percentage of net sales* by dividing each number on the income statement by net sales.
- C. On the balance sheet, *each item is expressed as a percentage of total assets* by dividing each number on the balance sheet by total assets.
- D. Vertical analysis shows the relative size of financial statement items and can help uncover any deviations from normal.

Teaching Tip

Work through the calculations and emphasize the differences in the horizontal analyses reported in Exhibits 18-4 and 18-5.

Learning Objective 3: Prepare and use common-size financial statements

(What are common-size financial statements, and how do we use them?)

- A. **Common-size statements** are a type of vertical analysis.
- B. Common-size statements are also useful when **benchmarking** a company against industry averages. Such a comparison to standards set by other companies often helps a company improve its performance.
- C. Exhibit 18-6 is a common-size analysis of the current assets of Spin Master from Exhibit 18-5.
- D. A company may also compute common-size statements for *benchmarking against key competitors*, as illustrated in Exhibit 18-7.

Teaching Tip

Review the procedures necessary to prepare a common-size income statement. Point out that the computations are the same as vertical analysis. Point out that the balance sheet may be presented in common-size format where the total amount of assets represents 100 percent.

Learning Objective 4: Compute the standard financial ratios

(How do we compute standard financial ratios, and what do they mean?)

- A. The calculation and interpretation of ratios is an important part of financial analysis. Many firms include key ratios in a special section of their annual reports.
- B. Exhibits 18-8 and 18-9 show a set of financial statements whose amounts will be used in the chapter

to illustrate the ratios.

C. Certain ratios are used to measure a firm's **ability to pay current liabilities**.

1. **Working capital** is a measure of the amount of current assets remaining after all current liabilities have been paid. The computation is:

$$\text{Current assets} - \text{Current liabilities} = \text{Working capital}$$

2. The **current ratio** is a ratio of the current assets to the current liabilities. Acceptable current ratios vary from industry to industry, but generally, the higher the current ratio, the greater the liquidity of the company. The computation is:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \text{Current ratio}$$

3. The **acid-test (quick) ratio** measures the ratio of the liquid, or quick, assets (cash, short-term investments, and net current receivables) to current liabilities. The higher the quick ratio, the greater the liquidity of the company. The computation is:

$$\frac{\text{Cash} + \text{Short-term investments} + \text{Net current receivables}}{\text{Current liabilities}} = \text{Quick ratio}$$

D. Certain ratios are used to measure a firm's **ability to sell inventory and collect receivables**.

1. **Inventory turnover** measures how many times a year the company sells its average level of inventory. Generally, a high inventory turnover indicates that the inventory is selling well. The computation is:

$$\frac{\text{Cost of goods sold}}{\text{*Average inventory}} = \text{Inventory turnover}$$

$$\text{*Average inventory} = \frac{(\text{Beginning inventory} + \text{Ending inventory})}{2}$$

2. **Accounts receivable turnover** measures how quickly the company collects cash from credit customers. Generally, a higher turnover is better. The computation is:

$$\frac{\text{Net credit sales}}{\text{*Average net accounts receivable}} = \text{Accounts receivable turnover}$$

$$\text{*Average accounts receivable} = \frac{(\text{Beginning receivables} + \text{Ending receivables})}{2}$$

Also included is **Days' Sales in Inventory** = 365 days/inventory turnover

3. **Days' sales in average accounts receivable** (days' sales in receivables) tells how many days' sales remain uncollected in accounts receivable. The computation is:

$$\frac{\text{Average net accounts receivable}}{(\text{Net sales} \div 365)} = \text{Days' sales in average accounts receivable}$$

E. Certain ratios are used to measure the **ability of a company to pay long-term debt**.

1. The **debt ratio** shows the proportion of the company's assets financed with debt. The greater the proportion of debt, the more fixed debt and interest payments the company must make. Higher debt leads to greater risk. The computation is:

$$\frac{\text{Total liabilities}}{\text{Total assets}} = \text{Debt ratio}$$

Teaching Tip

If the debt ratio is 1.0, then debt has been used to finance all the assets. Point out that most companies need at least some debt. Discuss what information is provided by these ratios.

Help students create memory tricks and mnemonics to enhance recall of all the ratios. For example, one student, a former fashion major, came up with the following to help her remember the debt ratio: "If I go to LA I will be in debt" where LA (Los Angeles) = L/A (Liabilities / Assets) and she will spend too much money and therefore be in debt.

2. **Times-interest-earned ratio (interest coverage)** tells how many times operating income can cover interest expense. Generally, the higher the number of times interest is earned, the better. The computation is:

$$\frac{\text{Income from operations}}{\text{Interest expense}} = \text{Times-interest-earned}$$

F. Certain ratios are used to measure **profitability**.

1. **Rate of return on net sales** (or "return on sales") is the same as the calculation on the common-size income statement that shows income as a percentage of net sales. This ratio shows what percentage net income is of every sales dollar. The computation is:

$$\frac{\text{Net income}}{\text{Net sales}} = \text{Rate of return on net sales}$$

2. **Rate of return on total assets** (or "return on assets") measures how successful the business is in using assets to earn a profit. Generally, a higher return is better. The computation is:

$$\frac{(\text{Net income} + \text{Interest expense})}{\text{*Average total assets}} = \text{Rate of return on total assets}$$

$$\text{*Average total assets} = \frac{(\text{Beginning assets} + \text{Ending assets})}{2}$$

3. **Rate of return on common shareholders' equity** (or “return on equity”) expresses the relationship between the common shareholders' investment and net income. Generally, a higher return is better. If a company is favourably **leveraged**, then the return on assets will be greater than the rate of return on common shareholders' equity. This practice is called **trading on the equity**. The computation is:

$$\frac{(\text{Net income} - \text{Preferred dividends})}{\text{*Average common shareholders' equity}} = \frac{\text{Rate of return on common shareholders' equity}}{2}$$

$$\text{*Average common shareholders' equity} = \frac{(\text{Beginning} + \text{Ending common shareholders' equity})}{2}$$

4. **Earnings per common share (EPS)** measures the income generated by one share. The computation is:

$$\frac{(\text{Net income} - \text{Preferred dividends})}{\text{Weighted average number of common shares outstanding}} = \text{Earnings per share}$$

Teaching Tip

Emphasize that the primary goal of business is to earn a profit. As such, profitability ratios are reported in financial news publications. Provide a brief description of the term “return,” which is loosely used as an evaluation of profitability.

G. Certain ratios are used to **analyze shares as an investment**.

1. The **price/earnings ratio (P/E)** is important to an investor-owner when evaluating whether to hold, buy, or sell shares. The computation is:

$$\frac{\text{Market price per common share}}{\text{Earnings per share}} = \text{P/E ratio}$$

Teaching Tip

Note that the market price cannot be obtained by examining a company's financial statements. It is available by examining financial news listings.

2. **Dividend yield** measures the percentage of a share's market value that is returned annually as dividends. The computation is:

$$\frac{\text{Dividend per common share}}{\text{Market price per common share}} = \text{Dividend yield}$$

3. **Book value per share** expresses the net assets per common share. The computation is:

$$\frac{(\text{Total shareholders' equity} - \text{Preferred equity})}{\text{Number of common shares outstanding}} = \text{Book value per share}$$

- H. Because **business decisions** are made in a complex financial environment, ratios can help managers make better decisions.

1. To be most useful for problem solving and decision making, *individual items that make up a ratio* should be analyzed.
 2. Other factors should also be considered, including information about the company and its line of business, general economic conditions, and competition.
 3. The president's letter to shareholders, management's discussion and analysis (MD&A), and the auditor's report are documents containing **non-financial data** that may hold important information relevant to the analysis.
- I. “**Red flag**” items that may be a sign of financial trouble:
1. Movement of sales, inventory, and receivables.
 2. Earnings problems
 3. Decreased cash flows
 4. Too much debt
 5. Inability to collect receivables
 6. Buildup of inventories
- J. Ratios should be analyzed over several years to be most helpful.

Learning Objective 5: Describe the impact of IFRS on financial statement analysis)
(What is the impact of IFRS on financial statement analysis?)

The procedures for performing financial analysis do not change because of the accounting standard being used. This is because financial analysis involves determining relationships between various components of the statements to assess the company's current position and to predict future performance.

Assignment Grid (2nd column: * = Excel Template available; W = writing required)

<i>Assignment</i>		<i>Topic(s)</i>	<i>Learning Objective(s)</i>	<i>Time in Minutes</i>	<i>Level of Difficulty</i>	<i>MyLab Pre-Test/ Post-Test</i>
Starter 18-1		Horizontal analysis of revenues and gross margin	1	5-10	Easy	
Starter 18-2		Trend analysis of revenues and net income	1	5-10	Easy	
Starter 18-3		Vertical analysis of income statement	2	10	Easy	
Starter 18-4		Vertical analysis of assets	2	5-10	Easy	
Starter 18-5		Common-size income statements of two companies	3	10	Easy	
Starter 18-6		Match terms with definitions	1, 2, 4	5	Easy	
Starter 18-7		What ratios evaluate	4	5	Easy	
Starter 18-8		Understanding ratio results	4	5	Easy	
Starter 18-9		Evaluating a company's current ratio	4	5-10	Easy	
Starter 18-10		Computing inventory turnover and days' sales in receivables	4	5-10	Easy	
Starter 18-11		Measuring ability to pay liabilities	4	5	Easy	
Starter 18-12		Measuring profitability	4	10	Easy	
Starter 18-13		Computing EPS and the price/earnings ratio	4	5-10	Easy	
Starter 18-14		Using ratio data to reconstruct an income statement	4	10-15	Medium	
Starter 18-15		Using ratio data to reconstruct a balance sheet	4	15-20	Medium	
E18-1	*	Horizontal analysis of an income statement	1	10-15	Easy	
E18-2		Computing trend percentages	1	5-15	Easy	
E18-3		Vertical analysis of a balance sheet	3	10-15	Medium	
E18-4	*	Preparing a common-size income statement	3	10-15	Easy	
E18-5		Common-size analysis of assets	3	10	Medium	
E18-6		Computing year-to-year changes in working capital	1, 4	5-15	Easy	
E18-7		Interpreting ratio results	4	10	Medium	
E18-8	*	Computing liquidity and efficiency ratios	4	10-15	Medium	
E18-9		Compute ratios and analyze a company	4	15-20	Medium	
E18-10		Analyzing profitability	4	10-15	Medium	
E18-11		Evaluating shares as an investment	4	10-15	Medium	
E18-12		Using ratio data to reconstruct a company's balance sheet—Challenge Exercise	2,3,4	20-30	Difficult	
E18-13		Compute the standard financial ratios	4	60-70	Medium	
E18-14		Using ratios to reconstruct a balance sheet	4	20-30	Difficult	
E18-15		Computing ratios under ASPE and IFRS	4, 5	20-30	Medium	
BN18-1	W	Understanding the components of accounting ratios	4	10-15	Medium	

<i>Assignment</i>		<i>Topic(s)</i>	<i>Learning Objective(s)</i>	<i>Time in Minutes</i>	<i>Level of Difficulty</i>	<i>MyLab Pre-Test/ Post-Test</i>
BN18-2	W	Taking unethical action to improve accounting ratios	4	10-15	Difficult	
EI18-1	W	Ethical Issue	n/a	n/a		
P18-1A		Trend percentages return on common equity, and comparison with the industry	1	20-30	Medium	Pre-Test
P18-2A		Performing vertical analysis	2	20-25	Medium	
P18-3A		Common-size statements, analysis of profitability, and comparison with the industry	2, 3	20-30	Medium	Pre-Test
P18-4A		Effects of business transactions on selected ratios	4	30-40	Difficult	
P18-5A		Using ratios to evaluate a share investment	4	30-40	Difficult	
P18-6A		Using ratio data to complete a set of financial statements	4	20-25	Difficult	
P18-7A		Using ratios to decide between two share investments	4	45-60	Medium	
P18-8A		Preparing a horizontal and vertical analysis of a financial statement, computing the standard financial ratios used for decision making, using ratios in decision making	1, 2, 4	40-60	Difficult	Pre-Test
P18-1B		Trend percentages return on sales, and comparison with the industry	1	20-30	Medium	Post-Test
P18-2B		Performing vertical analysis	2	20-25	Medium	
P18-3B		Common-size statements, analysis of profitability, and comparison with the industry	2, 3, 4	20-30	Medium	Post-Test
P18-4B		Effects of business transactions on selected ratios	4	40-50	Difficult	
P18-5B		Using ratios to evaluate a share investment	4	40-50	Difficult	
P18-6B		Using ratio data to complete a set of financial statements	4	20-25	Difficult	
P18-7B	*	Using ratios to decide between two share investments	4	40-60	Medium	
P18-8B		Preparing a horizontal and vertical analysis of a financial statement, computing the standard financial ratios used for decision making, using ratios in decision making	1, 2, 4	40-60	Difficult	Post-Test
P18-1C	W	Using horizontal analysis to assess whether a company is using improper accounting practices – Challenge Problem	1	20-30	Difficult	
P18-2C	W	Understanding the impact of improper accounting practices on the financial	4	20-30	Difficult	

<i>Assignment</i>		<i>Topic(s)</i>	<i>Learning Objective(s)</i>	<i>Time in Minutes</i>	<i>Level of Difficulty</i>	<i>MyLab Pre-Test/ Post-Test</i>
		statements of a company – Challenge Problem				
DP18-1	W	Identifying action to cut losses and establish profitability	2,4	20-30	Medium	
FSC18-1	W	Measuring profitability and analyzing shares as an investment	4	20-30	Medium	
IFRS Mini Case	W	See MyLab				
Comprehensive Problem for Part 4	W	Analyzing a company for its investment potential. See MyLab				

CHAPTER 18 TEN-MINUTE QUIZ

Circle the letter of the best response.

1. Which of the following statements is true?
 - A. The study of percentage changes in comparative statements is called vertical analysis.
 - B. Vertical analysis of the income statement generally shows all amounts as a percentage of net sales.
 - C. In calculating a percentage change in Net Sales, the difference between Net Sales for the two years is divided by Net Sales of the most recent year.
 - D. Trend percentages are a form of vertical analysis.

2. Gold Corporation computes common-size percentages for its income statement. Based on the following data, what percentage would be shown on the income statement for Gross Margin?

Cost of Goods Sold	\$ 1,080,000
Interest Expense	210,000
Net Sales	1,800,000
Gross Sales	2,200,000
Total Assets	3,500,000

 - A. 40%
 - B. 49%
 - C. 51%
 - D. 60%

3. Which of the following is *not* an objective of financial statement analysis?
 - A. Financial statement analysis helps creditors assess short-term liquidity.
 - B. Financial statement analysis helps investors and creditors assess the profitability of a company.
 - C. Investors use financial statement analysis to help predict the amount of dividends they are likely to receive in the future.
 - D. Financial statement analysis helps investors determine a company's ability to generate enough cash to pay debt as it matures.

4. Which of the following does *not* help measure a company's ability to pay its current liabilities?
 - A. the acid-test ratio
 - B. the current ratio
 - C. the debt ratio
 - D. working capital

5. How would the issuance of common shares in the last month of the fiscal year affect cash, the current ratio, and the rate of return on common shareholders' equity?

	Cash	Current Ratio	Rate of Return on Common Shareholders' Equity
A.	increase	increase	decrease
B.	increase	no effect	decrease
C.	no effect	increase	no effect
D.	increase	increase	increase

Table 18-1

Presented here are the comparative balance sheets and the income statement for Hart Incorporated.

Hart Incorporated
Balance Sheet
December 31, 2020 and 2019

<u>Assets</u>	<u>2020</u>	<u>2019</u>
Cash	\$ 21,000	\$ 30,800
Accounts receivable	59,000	70,000
Inventory	100,000	129,200
Property, plant, and equipment, net	<u>400,000</u>	<u>550,000</u>
Total	<u>\$580,000</u>	<u>\$780,000</u>
<u>Liabilities and Shareholders' Equity</u>		
Accounts payable	\$ 55,000	\$ 62,000
Accrued expenses payable	25,000	26,000
Bonds payable	100,000	200,000
Common shares	330,000	410,000
Retained earnings	<u>70,000</u>	<u>82,000</u>
Total	<u>\$580,000</u>	<u>\$780,000</u>

Hart Incorporated
Income Statement
For the Year Ended December 31, 2020

Sales	\$880,000
Cost of goods sold	<u>640,000</u>
Gross margin	240,000
Operating expenses	<u>156,000</u>
Operating income	84,000
Interest expense	<u>12,000</u>
Income before income tax	72,000
Income tax expense	<u>24,000</u>
Net income	<u>\$ 48,000</u>

6. Refer to Table 18-1. The quick ratio for 2020 would be:
 - A. 0.44:1
 - B. 1:1
 - C. 1.45:1
 - D. 3.27:1

7. Refer to Table 18-1. The rate of return on total assets for 2020 would be:
 - A. 5.5%
 - B. 8.8%
 - C. 10.6%
 - D. 12.4%

8. Refer to Table 18-1. The times-interest-earned for 2020 would be:
 - A. 2 times
 - B. 4 times
 - C. 6 times
 - D. 7 times
9. The accountant for Dana Corp. noticed that the debt ratio of the company and the cash flow from financing activities increased over the last year while the total assets of the company remained the same. The situation indicates that:
 - A. total liabilities increased during the year.
 - B. current liabilities decreased during the year.
 - C. cash flow from operating activities will likely be higher in succeeding years due to higher dividend payments.
 - D. net income as a percentage of total assets remained the same.
10. During the year, a company earned a lower rate of return on assets than the interest rate incurred to acquire those assets. This situation indicates that the company:
 - A. is trading on the equity.
 - B. applied favourable financial leverage.
 - C. applied unfavourable financial leverage.
 - D. both A and B.

Answer Key to Chapter 18 Quiz:

1. B 2. A 3. D 4. C 5. A 6. B 7. B 8. D 9. A 10. C