

Financial analysis

Lecture 8

Prepared by Dr. Walaa Mohamed

MGM 237
Introduction to Finance



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

Financial Analysis

LEARNING OBJECTIVES

After studying this chapter, you should be able to do the following:

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.

WHERE WE HAVE BEEN...

The previous chapter introduced the three basic financial statements and some basics of accounting, which is the language of business. Not only do financial market participants, such as bondholders, shareholders, and bankers analyze the financial statements, but the firm's managers also use them to analyze their own firms and their firm's competition, as well as plan for future strategies and financing needs.

WHERE WE ARE GOING ...

A myriad of financial market participants will use and analyze financial statement information, particularly bankers, other lenders, suppliers, investors, and some of the firm's customers.

HOW THIS CHAPTER APPLIES TO ME...

Publicly available data can be analyzed to show workers and investors how well the firm is doing. For private firms, statement analysis and industry comparisons contain similar information for internal use. A few simple ratio calculations can tell you as an employee or investor how well a firm is doing and how it is making profits.

This chapter gives insight into how lenders make decisions about lending money to YOU. They will review your personal “balance sheet” (your assets and debts) and income statement (your monthly income and checking account information) when you apply for a car loan or mortgage.

Part of being a good manager is managing people and assets well. Successful financial analysis and planning require an understanding of a firm’s external and internal environments. Prior chapters have discussed important external influences affecting firms, such as fluctuations in inflation, interest rates, exchange rates, and government policy. The firm’s internal environment includes items that can be affected by management, such as organizational structure, worker motivation and productivity, cost control, and the firm’s plant and operations.

Of course, a number of interrelationships exist between a firm’s external and internal environment. Firm sales will be affected by the state of the economy, management’s ability to handle growth, and the quality and marketing of the firm’s product. Pricing decisions are influenced by the state of the economy, actions by competitors, and the firm’s production costs.

The joint impact of the external and internal environments on a firm is best reflected in the firm’s financial statements. These statements provide measures of the success or failure of the firm’s strategies and policies, quantified in financial terms. Such information is valuable to the firm’s managers, as well as to stock and bond analysts, bank loan officers, and competitors. The information found on the financial statements is invaluable for analyzing a firm’s past as well as for planning for its future.

For investors, how we analyze financial statements will depend upon the economic environment, too. For example, a firm with high debt ratios may be an attractive investment at the end of a recession as economic growth begins. Rapidly expanding sales will generate cash to pay interest leaving high levels of profits. The same debt ratios at the end of a period of economic growth, with a recession growing near, may make the firm appear unattractive for investment purposes.

This chapter addresses how to analyze a firm’s financial statements to identify a firm’s strengths and weaknesses.

14.1

Financial Statement Analysis

The financial statements discussed in Chapter 13 were designed to report a firm’s financial position at a point in time, as well as the results of its operations over a period of time. The real usefulness of these statements comes from the help they provide in predicting the firm’s future earnings and dividends along with the risks associated with these variables.

Financial statement analysis can affect nonfinance operations of a firm. For example, a salesperson could lose a new customer and a sales commission should a check of the customer's financial statements lead to the conclusion the customer is a bad credit risk. An analysis that indicates excessive levels of inventories could lead to a change in the firm's pricing and marketing strategies and could affect the firm's production plan, even leading to worker layoffs.

A firm's management reviews its financial statements to determine if progress is being made toward company goals. Internal documents based on this analysis inform division managers of the status of their divisions and product lines and how these results compare to the year's plan.

Many individuals and organizations analyze firms' financial statements. A firm that seeks credit, from a supplier firm or a bank, typically must submit financial statements for examination. Potential purchasers of a firm's bonds will analyze financial statements to gauge the firm's ability to make timely payments of interest and principal. Potential shareholders should examine financial statements as they are an excellent source of firm information. Present shareholders will want to examine financial statements to monitor firm performance.

Ratio Analysis of Balance Sheet and Income Statement

ratio analysis financial technique that involves dividing various financial statement numbers into one another

Ratio analysis is a valuable method for gaining insights regarding a firm's strengths and weaknesses. Ratios are constructed by dividing various financial statement numbers into one another. The ratios can then be examined to more easily determine trends and reasons for changes in the financial statement quantities. Ratios are valuable tools, as they standardize balance sheet and income statement numbers. Thus, differences in firm size will not affect the analysis. A firm with \$10 billion in sales can be easily compared to a firm with \$1 billion or \$200 million in sales.

trend analysis (time series analysis) used to evaluate a firm's performance over time

cross-sectional analysis different firms are compared at the same point in time

industry comparative analysis compares a firm's ratios against average ratios for other companies in the firm's industry

Three basic categories of ratio analysis are used. First, financial ratios can be used in **trend analysis** (also known as **time series analysis**) to evaluate a firm's performance over time. Second, ratios are used in **cross-sectional analysis**, in which different firms are compared at the same point in time. Third, **industry comparative analysis** is used to compare a firm's ratios against average ratios for other companies in the firm's industry. This allows the analyst to evaluate the firm's financial performance relative to industry norms.

Comparing a firm's ratios to average industry ratios requires caution. Some sources of industry data report the **average** for each ratio, others report the **median**, and others report the **interquartile range** for each ratio (that is, the range for the middle 50 percent of ratio values reported by firms in the industry).

Five other difficulties can arise as well. **First**, by their nature, industry ratios are narrowly focused on a specific industry, but the operations of large firms such as AT&T, ExxonMobil, and IBM often cross many industry boundaries.

Second, accounting standards often differ among firms in an industry. This can create confusion, particularly when some firms in the industry adopt new accounting standards (set forth by the Financial Accounting Standards Board, or FASB) before others. Adopting standards early can affect a firm's ratios by making them appear unusually high or low as compared to the industry average.

Third, care must be taken when comparing different types of firms in the same industry. In one industry, there may be large and small firms, multinational and domestic firms, firms that operate nationally, and those which focus only on limited geographic markets. Some firms may use a year-end date of December 31 but others may choose another date for their end-of-year financial reporting.

Fourth, analysts and sources of public information on ratios may compute ratios differently. Some may use after-tax earnings, some pretax earnings; others may assume "debt" refers only to long-term debt while still others include all liabilities as debt. Some use year-end numbers from the most recent balance sheet while others may compute a financial ratio using an average value from the previous and the most recent balance sheet. Make sure you are aware of how a resource defines its ratios before using it for analysis.

Fifth, firms change over time, which may make it difficult to assess changes in financial ratios. A firm may merge with another firm or spin off (divest) a division. Such changes in the

firm may affect the level of a financial ratio from earlier time periods. We'll see that first-hand in this chapter as we use Walgreens as our sample firm for computing financial ratios. In 2015, Walgreens completed a merger with a German retail drug store, Boots Alliance. Thus, the most recent financial statements and financial ratios will differ in some cases from prior years, as assets, liabilities, sales, and expenses of two firms are combined into one firm, WalgreensBoots Alliance, which we will simply refer to as "Walgreens."

How an analyst interprets a ratio depends on for whom the analyst works. Whether a ratio appears favorable or unfavorable depends on the perspective of the user. For example, a short-term creditor, such as a bank loan officer, mostly wants to see a high degree of liquidity. This analyst is somewhat less concerned with a firm's profitability. An equity holder would rather see less liquidity and more profitability. Therefore, the analyst must keep in mind the perspective of the user in evaluating and interpreting the information contained in financial ratios.

Types of Financial Ratios

Many types of ratios can be calculated from financial statement data or stock market information. However, it is common practice to group ratios into five basic categories:

1. Liquidity ratios
2. Asset management ratios
3. Financial leverage ratios
4. Profitability ratios
5. Market value ratios

The first four categories are based on information taken from a firm's income statements and balance sheets. The fifth category relates stock market information to financial statement items. We will use the financial statements for Walgreens that were introduced in lecture 7 to illustrate how financial statement analysis is conducted. Table 14.1 and 14.2 contain Walgreens' balance sheets and income statements for several years. For comparative purposes, for each ratio group, we present graphs of Walgreens' ratios as well as ratios for a retail drug store industry competitor, CVS, over the 1997–2015 time period.

TABLE 14.1 Balance Sheets for Walgreens (\$ millions)

	2012	2013	2014	2015
Cash & cash equivalents	\$1,297	\$2,106	\$2,646	\$3,000
Accounts receivable	\$2,167	\$2,632	\$3,218	\$6,849
Inventories	\$7,036	\$6,852	\$6,076	\$8,678
Other current assets	\$260	\$284	\$302	\$1,130
Total Current Assets	\$10,760	\$11,874	\$12,242	\$19,657
Net fixed assets	\$12,038	\$12,138	\$12,257	\$15,068
Other long-term assets	\$8,503	\$9,059	\$10,324	\$17,685
Goodwill & intangibles	\$2,161	\$2,410	\$2,359	\$16,372
Total Fixed Assets	\$22,702	\$23,607	\$24,940	\$49,125
TOTAL ASSETS	\$33,462	\$35,481	\$37,182	\$68,782
Accounts payable	\$4,384	\$4,635	\$4,315	\$10,088
Short-term debt	\$1,319	\$570	\$774	\$1,068
Other current liabilities	\$3,019	\$3,678	\$3,806	\$5,401
Total Current Liabilities	\$8,722	\$8,883	\$8,895	\$16,557
Long-term debt	4,073	\$4,477	\$3,736	\$13,315
Other liabilities	\$2,431	\$2,667	\$4,094	\$8,049
TOTAL LIABILITIES	\$15,226	\$16,027	\$16,725	\$37,921
Preferred equity	0	\$0	\$0	\$0
Common equity + Retained earnings	\$18,236	\$19,454	\$20,457	\$30,861
TOTAL STOCKHOLDERS' EQUITY	\$18,236	\$19,454	\$20,457	\$30,861
TOTAL LIABILITIES & EQUITY	\$33,462	\$35,481	\$37,182	\$68,782

TABLE 14.2 Income Statements for Walgreens (\$ millions)

	2012	2013	2014	2015
Revenue	\$71,633	\$72,217	\$76,392	\$103,444
Cost of goods sold	\$50,125	\$51,098	\$54,823	\$76,520
Selling, general, administrative Expenses and depreciation	\$18,044	\$17,179	\$17,375	\$22,256
Operating income	\$3,464	\$3,940	\$4,194	\$4,668
Interest expense	\$88	0	\$156	0
Other expenses (Income)	0	\$45	\$481	(\$643)
Income before taxes	\$3,376	\$3,895	\$3,557	\$5,311
Income taxes	\$1,249	\$1,445	\$1,526	\$1,056
Net income	\$2,127	\$2,450	\$2,031	\$4,255
Earnings per share	\$2.42	\$2.59	\$2.03	\$4.05

Liquidity Ratios and Analysis

The less liquid a firm is, 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.

We can estimate the firm's liquidity position by examining specific balance sheet items. Liquidity ratios indicate the ability to meet short-term obligations to creditors as they mature or come due. This form of liquidity analysis focuses on the relationship between current assets and current liabilities, and the rapidity with which receivables and inventory turn into cash during normal business operations. This means the immediate source of cash funds for paying bills must be cash on hand, proceeds from the sale of marketable securities, or the collection of accounts receivable. Additional liquidity comes from inventory that can be sold and, thus, converted into cash directly through cash sales or indirectly through credit sales (accounts receivable).

The dollar amount of a firm's **net working capital**, or its current assets minus current liabilities, is sometimes used as a measure of liquidity, but two popular ratios are also used to gauge a firm's liquidity position. **The current ratio** is a measure of a company's ability to pay off its short-term debt as it comes due. The current ratio is computed by dividing the current assets by the current liabilities. Typically, assets and liabilities with maturities of one year or less are considered to be current for financial statement purposes.

A low current ratio (low relative to, say, industry norms) may indicate a company may face difficulty in paying its bills. **A high value for the current ratio, however, does not necessarily imply greater liquidity.** It may suggest that funds are being inefficiently employed within the firm. Excessive amounts of inventory, accounts receivable, or idle cash balances could contribute to a high current ratio.

We can calculate the current ratio for 2015 and 2014 as follows:

CURRENT RATIO:

2015: $(\text{Current assets} / \text{Current liabilities}) = (\$19,657 / \$16,557) = 1.19 \text{ times}$

2014: $(\$12,242 / \$8,895) = 1.38 \text{ times}$

Walgreens' current ratio fell from 2014 to 2015. Table 14.1 shows all of Walgreens' current assets rose in 2015, no doubt due to the merger. Current liabilities nearly doubled in 2015, rising more than current assets (an 86 percent rise in current liabilities compared to a 60 percent rise in current assets). Although both quantities rose, the joint effect of the larger rise in current liabilities was a decline in the current ratio.

The quick ratio, or *acid test ratio*, is computed by dividing the sum of cash, marketable securities, and accounts receivable by the current liabilities. This comparison eliminates inventories from consideration since inventories are among the least liquid of the major current asset categories because they must first be converted to sales.

In general, a ratio of 1.0 indicates a reasonably liquid position in that an immediate liquidation of marketable securities at their current values and the collection of all accounts receivable, plus cash on hand, would be adequate to cover the firm's current liabilities. However, as this ratio declines, the firm must rely increasingly on converting inventories to sales to meet current liabilities as they come due. Walgreens' quick ratios for 2015 and 2014 are the following:

QUICK RATIO:

2015: $(\text{Cash} + \text{Marketable securities} + \text{Accounts receivable} / \text{Current liabilities})$

$= (\$3,000 + 6,849) / \$16,557 = 0.59 \text{ times}$

2014: $(\$2,646 + 3,218) / \$8,895 = 0.66 \text{ times}$

According to the financial statement data, Walgreens' quick ratio is well below 1.0. As we will see, this is not a major cause for concern in the retail drug store industry. In this industry, we expect lower quick ratios, as much of Walgreens' current assets consist of inventory that awaits sale on the company's store shelves and warehouses.

When assessing the firm's liquidity position, financial managers also are interested in how trade credit from suppliers, which we call accounts payable, is being used and paid for. This analysis requires taking data from a firm's income statement in addition to the balance

liquidity ratios indicate the ability of the firm to meet short-term obligations as they come due

net working capital dollar amount of a firm's current assets minus current liabilities; sometimes used as a measure of liquidity

ملحوظة هامة
 ان مسألة في
 الكوييز أو الامتحانات
 قد يطلب في الحل
 استخدام الناحية السنة
 في حساب يوم ما
 من ان كرات السنة
 كبديسة

sheet. **The average payment period** is computed by dividing the year-end accounts payable amount by the firm's average cost of goods sold (COGS) per day. We calculate the average daily COGS by dividing the income statement's COGS amount by 365 days in a year (366 in leap year).

AVERAGE PAYMENT PERIOD:

Accounts payable / (Cost of goods sold / 365) = (Accounts payable / Cost of goods sold per day)

2015: [$\$10,088 / (\$76,520 / 365)$] = ($\$10,088 / \209.64) = 48.1 days

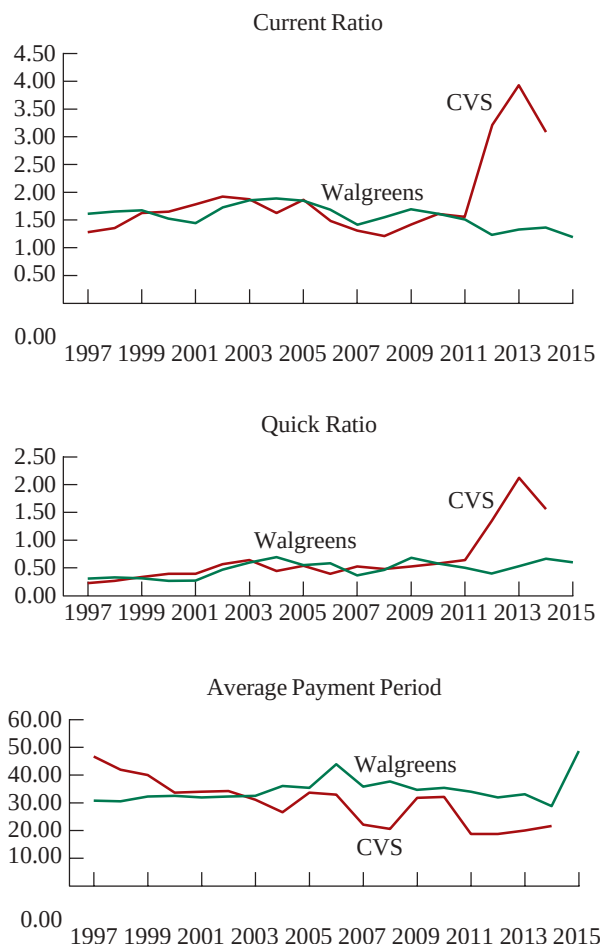
2014: [$\$4,315 / (\$54,823 / 365)$] = ($\$4,315 / \150.20) = 28.7 days

Walgreens slowed payments to its suppliers by nearly 20 days. In 2014, it took about one month to pay its suppliers; in 2015 it took over a month and one-half.

Figure 14.1 illustrates the trend of Walgreens's liquidity ratios in comparison to their industry averages. Walgreens' current ratio and quick ratio closely tracks the CVS ratios until 2012 when CVS's current and quick ratios rose sharply. Since both the current and quick ratio rose for CVS, we know inventory is not the reason as inventory doesn't appear in both ratios. Therefore, the increase in CVS's ratios is due to increases in its cash and receivables—or possibly declines in current liabilities. Walgreens' average payment period indicates that since 2003 the firm takes longer to pay suppliers than does CVS, with a marked increase in 2015 after its merger with Boots Alliance.

Overall, Walgreens' current and quick ratios have been relatively stable over this time frame, so there is little cause for alarm. CVS's current and quick ratios have sharply risen in recent years while its average payment period continues to decline over time. Walgreens' increase in average payment period may be the result of its larger global footprint after the merger with a German firm; no doubt suppliers will be watching Walgreens' payment behavior closely in the coming year. The increase in liquidity for CVS may not be a positive sign; it may indicate it has excess receivables and/or excess cash that it can better use by re-investing in the business.

FIGURE 14.1 Liquidity Ratios for Walgreens



Asset Management Ratios and Analysis

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* and each ratio in this category relates financial performance on the income statement with items on the balance sheet. Thus, we will be using information for Walgreens from Tables 14.1 and 14.2.

The **total assets turnover ratio** is computed by dividing net sales by the firm's total assets. It indicates how efficiently the firm is utilizing its total assets to produce revenues or sales. It is a measure of the dollars of sales generated by one dollar of the firm's assets. Generally, the more efficiently assets are used, the higher a firm's profits. The size of the ratio is influenced by characteristics of the industry within which the firm operates. Capital intensive electric utilities might have asset turnover ratios as low as 0.33, indicating they require \$3 of investment in assets to produce \$1 in revenues. In contrast, retail food chains with asset turnovers as high as 10 would require a \$0.10 investment in assets to produce \$1 in sales. A typical manufacturing firm has an asset turnover of about 1.5. Walgreens' 2014 and 2015 total asset turnover ratios are calculated as follows:

TOTAL ASSETS TURNOVER:

2015: $(\text{Net sales} / \text{Total assets}) = (\$103,444 / \$68,782) = 1.50 \text{ times}$

2014: $(\$76,392 / \$37,182) = 2.05 \text{ times}$

Asset utilization fell between 2014 and 2015 as total assets rose proportionately more (85 percent) than sales (about 35 percent). Both components of the ratio rose—but since the percentage increase in the denominator (total assets) was greater than the percentage change in the numerator (sales), this asset efficiency ratio fell by over 25 percent from its 2014 level. Again, this is, no doubt, a result of the combination of two firms in the Walgreens/Boots Alliance merger. It will be interesting to see if asset efficiency rises after all the “kinks” are worked out in this new global firm.

The **fixed assets turnover ratio** is computed by dividing net sales by the firm's net fixed assets and indicates the extent to which long-term assets are being used to produce sales. Similar to the interpretation given to the total asset turnover, the fixed assets turnover represents the dollars of sales generated by each dollar of fixed assets. Investment in plant and equipment is usually expensive. Consequently, unused, or idle capacity is costly and often represents a major factor for a firm exhibiting poor operating performance. On the other hand, a high (compared to competitors or the industry average) fixed assets turnover ratio is not necessarily a favorable sign; it may occur because of efficient use of assets (good), or it may occur because of the firm's use of technologically obsolete equipment, which has small book value because of the effects of accumulated depreciation (poor). An astute analyst will do research to determine which is the case for the firm under analysis.

FIXED ASSETS TURNOVER:

2015: $(\text{Net sales} / \text{Net fixed assets}) = (\$103,444 / \$15,068) = 6.87 \text{ times}$

2014: $(\$76,392 / \$12,257) = 6.23 \text{ times}$

Walgreens' fixed assets turnover rose from 6.23 to 6.87, indicating that sales increased more rapidly than net fixed assets. In percentage terms, net fixed assets increased 23 percent [i.e., $(\$15,068 - \$12,257) / \$12,257$] while sales rose over 35 percent [i.e., $(\$103,444 - \$76,392) / \$76,392$]. Whether this apparent increase in fixed asset efficiency—more sales per dollar of net fixed assets—will continue as Walgreens and Boots Alliance go forward after their merger remains to be seen. Note that the total asset turnover *fell* while the fixed asset turnover *rose*. Since both ratios use sales in the numerator, the difference must arise from the behavior of net fixed assets and total assets.

asset management ratios indicate extent to which assets are turned over or used to support sales

The *average collection period* is calculated as the year-end accounts receivable divided by the average net sales per day, and thus, indicates the average number of days that sales are outstanding. In other words, it reports the number of days it takes, on average, to collect credit sales made to the firm's customers. The average collection period measures the days of financing that a firm extends to its customers. Because of this, a shorter average collection period is usually preferred to a longer one. **Another measure that can be used to provide this same information is the receivables turnover.** The *receivables turnover* is computed by dividing annual sales, preferably credit sales, by the year-end accounts receivable. If the receivables turnover is six, this means that, on average, the average collection period is about two months (12 months divided by the turnover ratio of six). If the turnover is four times, the firm has an average collection period of about three months (12 months divided by the turnover ratio of four).

Walgreens' average collection periods for 2015 and 2014 were the following:

AVERAGE COLLECTION PERIOD:

$[\text{Accounts receivable} / (\text{Net sales} / 365)] = (\text{Accounts receivable} / \text{Net sales per day})$

2015: $[\$6,849 / (\$103,444 / 365)] = (\$6,849 / \$283.41) = 24.2 \text{ days}$

2014: $[\$3,218 / (\$76,392 / 365)] = (\$3,218 / \$209.29) = 15.4 \text{ days}$

Walgreens' average collection period has increased after the merger. Walgreens was collecting funds about nine days slower in 2015 than in 2014. This may be the result of the average of the "Walgreens" model of doing business with the "Boots Alliance" way of doing business—as well as the differences in past customers and customer payment practices of each firm. Again, we'll want to watch this ratio over time to see if it remains at its 2015 level or if it falls as Walgreens and Boots Alliances become better integrated. Comparing the average collection and payment periods, Walgreens is in a positive situation, as it collects from its customers over 20 days faster than it pays its suppliers. This has positive implications for Walgreens' asset efficiency and for its liquidity.

As with other ratios, the average collection period may be too high or low. An unusually low number of days required to collect sales for a particular line of business may indicate an unnecessarily tight internal credit policy that could result in lost sales. The firm may be selecting only the best customers or may be insisting on unusually strict payment terms. On the other hand, a high average collection period may indicate the firm may have too lax a policy concerning customer quality and/or credit payment terms. Thus, in deciding on a proper credit policy, monitoring trends over time is important, as is comparing the firm's average collection period relative to industry norms.

The *inventory turnover ratio* is computed by dividing the cost of goods sold by the year-end inventory. Here we are seeking to determine how efficiently the amount of inventory is being managed, so, on the one hand, the firm does not have to finance excess inventory, and on the other hand, adequate inventory supplies exist to avoid being out of stock of an item and losing potential sales (and profits). Stated differently, the inventory turnover ratio indicates whether the inventory is out of line in relation to the volume

of sales when compared against industry norms or when tracked over time for a specific firm.

INVENTORY TURNOVER:

2015: $(\text{Cost of goods sold} / \text{Inventory}) = (\$76,520 / \$8,678) = 8.82 \text{ times}$

2014: $(\$54,823 / \$6,076) = 9.02 \text{ times}$

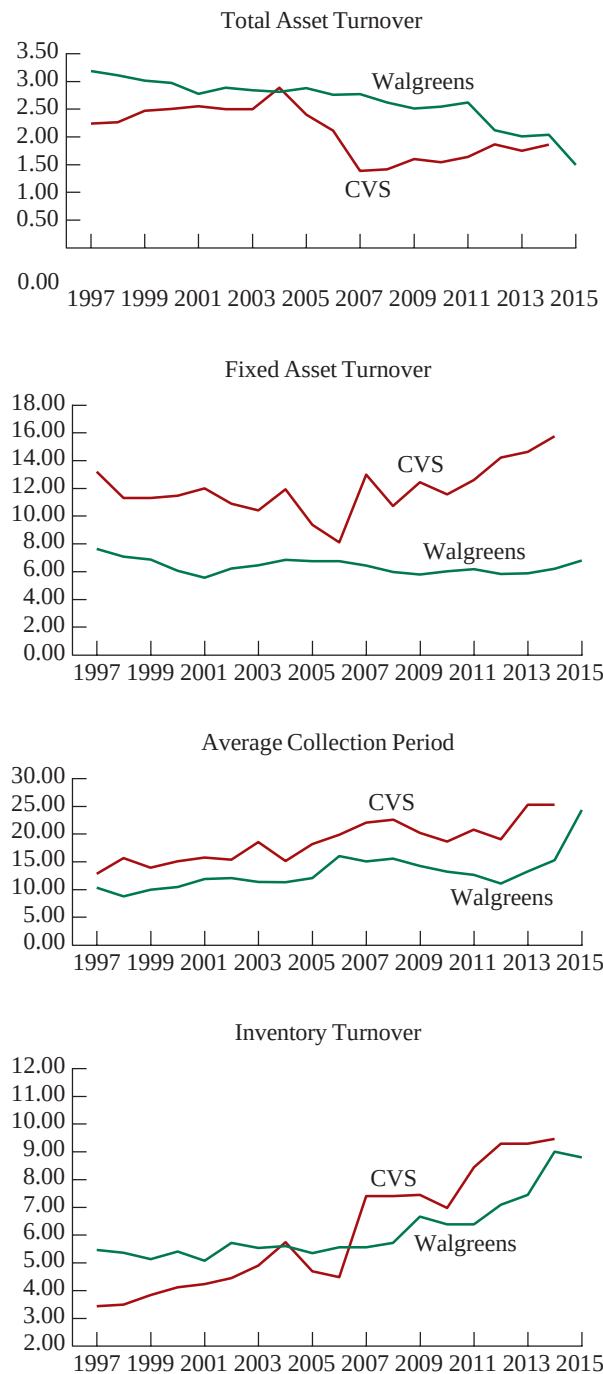
Walgreens' annual inventory turnover decreased slightly from 2014 to 2015. Both costs of goods sold and inventory rose by about the same proportion (about 40 percent for cost of goods sold and about 43 percent for inventory).

Inventory management requires a delicate balance between having too low an inventory turnover, which increases the likelihood of holding obsolete inventory, and too high an inventory turnover, which could lead to stock-outs and lost sales.

If a firm is growing rapidly (or shrinking rapidly), there may be distortions if year-end data is used for comparisons of ratios over time. To avoid such possible distortions, we can use the average inventory (beginning plus ending balances divided by two) to calculate inventory turnovers for comparison purposes. Likewise, average data for other balance sheet accounts should be used when rapid growth or contraction is taking place for a specific firm.

Figure 14.2 illustrates Walgreens' asset management ratios in comparison to those of CVS between 1997 and 2015. Both firms have declining total asset turnover ratios over time. Although for many of these years Walgreens' total asset turnover was higher, both Walgreens and CVS have similar ratios in the mid-2010s. CVS's fixed asset turnover and average collection period have been higher than Walgreens', indicating possibly more efficient use of net fixed assets and an easier collection policy toward customer payments. Inventory turnover has been rising for both firms with CVS, generally, being slightly more efficient since 2007.

FIGURE 14.2 Asset Management Ratios for Walgreens



14.4

Financial Leverage Ratios and Analysis

financial leverage ratios indicate the extent to which borrowed, or debt, funds are used to finance assets, as well as the ability of a firm to meet its debt payment obligations

Financial leverage ratios 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.

The total debt to total assets ratio is computed by dividing the total debt, or total liabilities, of the business by the total assets. This ratio shows the portion of the total assets financed by all creditors and debtors. We obtain the relevant balance sheet information for Walgreens from Table 14.1.

TOTAL DEBT TO TOTAL ASSETS:

2015: (Total debt/Total assets) = (\$37,921/\$68,782) = 0.55 = 55%

2014: (\$16,725/\$37,182) = 0.45 = 45%

Walgreens' total debt ratio rose. It appears the firm took on debt (or absorbed debt owed by Boots Alliance) as a result of the merger.

A total debt to asset ratio that is too high tells the financial manager the opportunities for securing additional borrowed funds are limited. Additional debt funds may be more costly in terms of the rate of interest that will have to be paid. Lenders will want higher expected returns to compensate for their risk of lending to a firm that has a high proportion of debt to assets. It is possible to have too low a ratio of total debt to total assets, which can be costly to the firm.⁵ Since interest expenses are deductible for income tax purposes, the government, in effect, pays a portion of the debt financing costs. A firm's debt costs are lower than the effective costs of equity.

Sometimes, a debt ratio is calculated that shows the total debt in relation to the dollars the owners have put in the firm. This is referred to as the *total debt to equity ratio*. Walgreens' ratio for 2015 was 1.23 (\$37,921/\$30,861), versus 0.82 (\$16,725/\$20,457) in 2014. For every dollar of equity, the firm has borrowed about 82 cents in 2014; for every dollar of equity, it borrowed \$1.23 in 2015. Walgreens definitely has more debt than before it merged with Boots Alliance.

The **equity multiplier ratio**, which provides another way of looking at the firm's debt burden, is calculated by dividing total assets by the firm's total equity.

EQUITY MULTIPLIER:

2015: (Total assets/Total equity) = (\$68,782/\$30,861) = 2.23

$$2014: (\$37,182 / \$20,457) = 1.82$$

Similar to the total debt to total assets ratio, the equity multiplier rose between 2014 and 2015.

At first glance, the ratio appears to have little to do with leverage; it is total assets divided by stockholders' equity. But recall the accounting identity: $\text{Assets} = \text{Liabilities} + \text{Equity}$. A higher level of assets relative to equity suggests greater use of debt. Thus, larger values of the equity multiplier imply a greater use of leverage by the firm. This can be seen by using the accounting identity and dividing everything by equity:

$$\frac{\text{Total assets}}{\text{Equity}} = \frac{\text{Total liabilities}}{\text{Equity}} + \frac{\text{Equity}}{\text{Equity}}$$

$$\frac{\text{Total assets}}{\text{Equity}} = \frac{\text{Total liabilities}}{\text{Equity}} + 1$$

On the left, we have the equity multiplier; on the right, we have the total debt to equity ratio plus one. This shows that more reliance on debt in order to finance the firm results in a larger equity multiplier. While the equity multiplier does not add to the information derived from the other debt ratios, it is useful when financial analysis is conducted using certain financial models.

In addition to calculating debt ratios, the financial manager should be interested in the firm's ability to meet or service its interest and principal repayment obligations on the borrowed funds. This is accomplished through the calculation of interest coverage and fixed charge coverage ratios. These ratios make use of information directly from the income statement or from footnotes to a firm's financial statements.

The **interest coverage**, or *times-interest-earned ratio*, is calculated by dividing the firm's operating income, or earnings before interest and taxes (EBIT), by the annual interest expense. Interestingly, Walgreens didn't report any interest expense in 2015. Below we compute interest coverage for 2014:

INTEREST COVERAGE:

2014: (Earnings before interest & taxes/Interest expense) = (\$4,194/\$156) = 26.9

Walgreens' interest coverage ratios are large, which indicates that interest-bearing debt is a small portion of Walgreens' financial structure.

⁵A low debt ratio can arise from the continued profitability of a firm and its additions to retained earnings. These additions to retained earnings will increase the level of equity relative to debt, unless the firm issues additional debt.

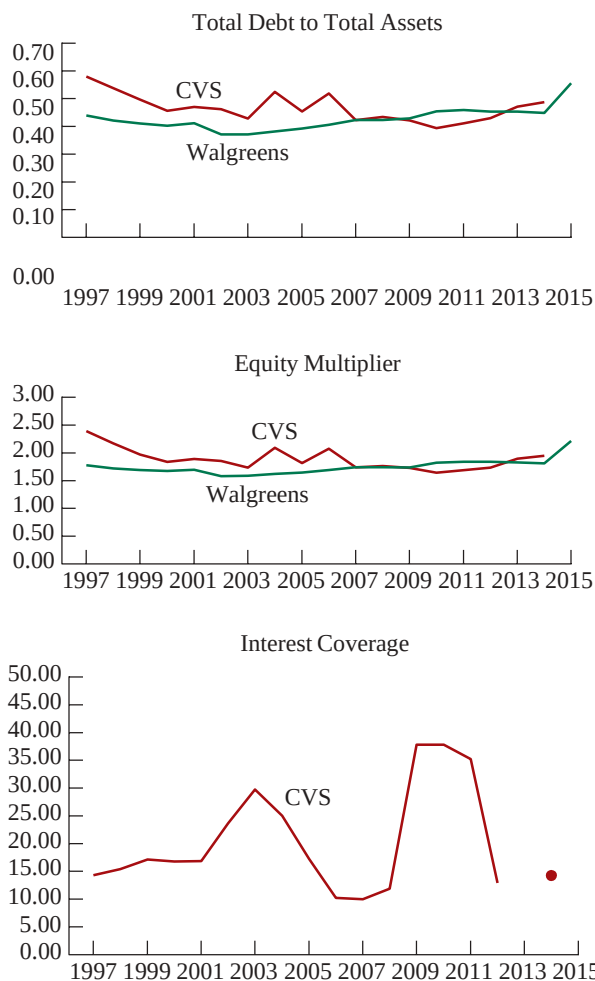
The interest coverage figure indicates the extent to which the operating income, or EBIT, level could decline before the ability to pay interest obligations would be impeded. Suppose that Walgreens' interest coverage ratio was 5.0. This would mean that Walgreens' operating income could drop to 20 percent, or one-fifth (in general, to one divided by the interest coverage ratio, in this example $1/5 = 0.20$), of its current level and interest payments still could be met.

The graphs of Walgreens' financial leverage ratios in [Figure 14.3](#) show its debt ratios declining and then rising during the 1997–2015 time frame while CVS's ratios showed a similar pattern. Both firms have little interest expense; the graph of the interest coverage ratio shows only CVS; there is no data point for 2013 as it reported no interest expense for that year. Walgreens' debt ratios stayed below or fairly close to those of CVS over time. Despite this, Walgreens' interest coverage ratio remains above that of the industry. During this time period, Walgreens' interest coverage ratio was at high levels or was undefined because of the absence of interest-bearing debt (thus, we do not show Walgreens' interest coverage ratio in Figure 14.3).

From looking at Walgreens, we can make three important conclusions. First, not all liabilities are contractual debt. Walgreens has a debt to assets ratio of about 55 percent but until 2015 had little interest-bearing debt, either short-term (such as notes payable) or long-term on its balance sheet. Second, not all liabilities require interest to be paid. Again, Walgreens has a debt ratio of 55 percent but nearly no interest payments. Third, to get a truer perspective of a firm's financial situation, all contractual fixed charges, including interest, lease payments, and sinking fund payments, should be examined. This requires some reading of the footnotes and other information in the firm's financial statements. Walgreens' high interest coverage ratio is reduced when fixed charges are considered and a fixed charge coverage ratio is computed.

Part of the reason for the behavior of Walgreens' ratios is that it acquired several firms in 2015. In the changing world of health care, size can be an advantage for negotiating with suppliers, corporate health care benefit providers, and government regulators; Walgreens, in recent years, has decided to grow by merger and acquisition. It acquired a 45 percent stake in European drugstore giant Alliance Boots GmbH for \$6.7 billion, with an option to purchase the remainder of the firm by 2015, and it exercised this option and completed the transaction in 2015. Walgreens acquired online drug retailer drugstore.com in March 2014 for \$429 million and Duane Reade in 2010 for \$1.2 billion. To acquire these stakes, Walgreens used existing balance sheet cash as well as new debt issues. In 2016, Walgreens reversed course and shut down drugstore.com in order to build its own online brand.

FIGURE 14.3 Financial
Leverage Ratios for Walgreens



14.5

Profitability Ratios and Analysis

Profitability ratios indicate the firm's ability to generate returns on its sales, assets, and equity.

Two basic profit margin ratios are important to the financial manager. **The operating profit margin** is calculated as the firm's earnings before interest and taxes (EBIT) divided by net sales. This ratio indicates the firm's ability to control operating expenses relative to sales. Table 14.2 contains income statement information for the Walgreens Corporation and provides the necessary information for determining the operating profit margin.

profitability ratios indicate the firm's ability to generate returns on its sales, assets, and equity

OPERATING PROFIT MARGIN:

2015: (Earnings before interest & taxes/Net sales) = (\$4,668/\$103,444) = 4.5%

2014: (\$4,194/\$76,392) = 5.5%

These results indicate that Walgreens' operating profitability fell from 2014 to 2015. Whether it was because of lower selling prices or higher costs, operating profit (EBIT) rose only 11 percent [(\$4,668 – \$4,194)/\$4,194] while sales rose over 35 percent [(\$103,444 – \$76,392)/\$76,392] following the merger.⁷

The net profit margin, a widely used measure of firm profitability, is calculated as the firm's net income after taxes divided by net sales. In addition to considering operating expenses, this ratio indicates the ability to earn a return after meeting interest and tax obligations. Unlike its operating profit margin, Walgreens' net profit margin rose in 2015:

NET PROFIT MARGIN:

2015: (Net income/Net sales) = (\$4,255/\$103,444) = 4.1%

2014: (\$2,031/\$76,392) = 2.7%

Walgreens' net income more than doubled in the face of a 35 percent increase in sales, resulting in a higher net profit margin in 2015.

Three basic rate-of-return measures on assets and equity are important to the financial manager. **The operating return on assets** is computed as the earnings before interest and taxes (EBIT) divided by total assets. This ratio focuses on the firm's operating performance and ignores how the firm is financed and taxed. Relevant data for Walgreens must be taken from Tables 14.1 and 14.2.

OPERATING RETURN ON ASSETS:

2015: (Earnings before interest & taxes/Total assets) = (\$4,668/\$68,782) = 6.8%

2014: (\$4,194/\$37,182) = 11.3%

Walgreens' operating return on assets fell in 2015, consistent with the behavior of the operating profit margin, as the large growth in assets following the merger was larger than the growth in operating income.

The net return on total assets, commonly referred to as **the return on total assets**, is measured as the firm's net income divided by total assets. Here, we measure the return on investment in assets after a firm has covered its operating expenses, interest costs, and tax obligations. Similar to the net profit margin, Walgreens' return on total assets rose in 2015 as net income rose over 100 percent from its 2014 level while assets grew by about 85 percent:

RETURN ON TOTAL ASSETS:

2015: (Net income/Total assets) = (\$4,255/\$68,782) = 6.2%

2014: (\$2,031/\$37,182) = 5.59%

A final profitability ratio is the *return on equity* (ROE). It measures the return that shareholders earned on their equity invested in the firm. The ROE is measured as the firm's net income divided by stockholders' equity. This ratio reflects the fact that a portion of a firm's total assets is financed with borrowed funds.

⁷Some people get confused when computing a percentage return using time series data as we do here. They know to find the difference between two numbers—but which to divide it by? You should divide by the “older,” or the earlier, number. That is, compute the percent change using the earlier number as the base: (newer number – older number)/older number. Or, in the case of our 2014 and 2015 data, compute [(2015 value – 2014 value)/2014 value].

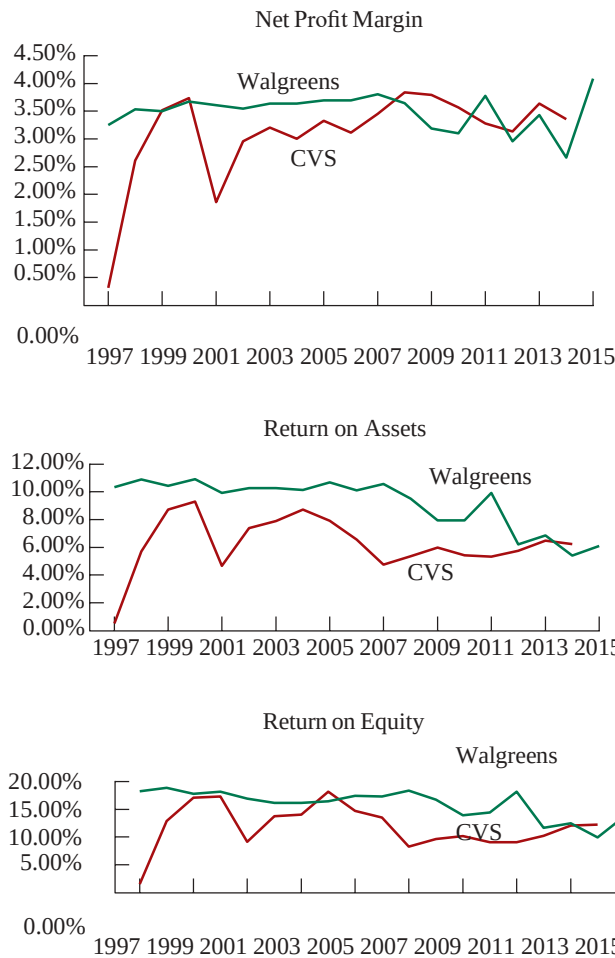


FIGURE 14.4 Profitability Ratios for Walgreens

Walgreens' ROE rose in 2015 after the merger was completed:

RETURN ON EQUITY:

2015: (Net income/Common equity) = (\$4,255/\$30,861) = 13.8%

2014: (\$2,031/\$20,457) = 9.9%

Figure 14.4 presents several Walgreens, and CVS's profitability ratios. We see for the first half of the time frame, Walgreens' net profit margin was, generally, higher and more stable than that of CVS but since the Great Recession Walgreens' net profit margin has become more volatile and sometimes is lower than that of CVS. Return on assets (ROA) shows similar behavior, as it exceeded CVS's ROA until 2014. It appears to be on a downward trend since the beginning of the Great Recession. ROE shows similar variability in recent years and a downtrend. Overall, these profit ratio trends indicate that Walgreens is becoming more like CVS in terms of its level of profitability relative to sales, assets, and equity.

14.6 Market Value Ratios and Analysis

The **market value ratios** indicate the willingness of investors to value a firm in the market-place relative to financial statement values. A firm's profitability, risk, quality of management, and many other factors are reflected in its stock and security prices by the efficient financial markets. Financial statements are historical in nature; the financial markets are forward-looking.⁸ We know that stock prices seem to reflect much of the known information about a company and are fairly good indicators of a company's true value. Hence, market value ratios indicate the market's assessment of the value of the firm's securities.

market value ratios indicate the willingness of investors to value a firm in the marketplace relative to financial statement values

⁸Recall from Chapter 10 that stock prices are in part based upon investors' *expectations of future* dividend growth.

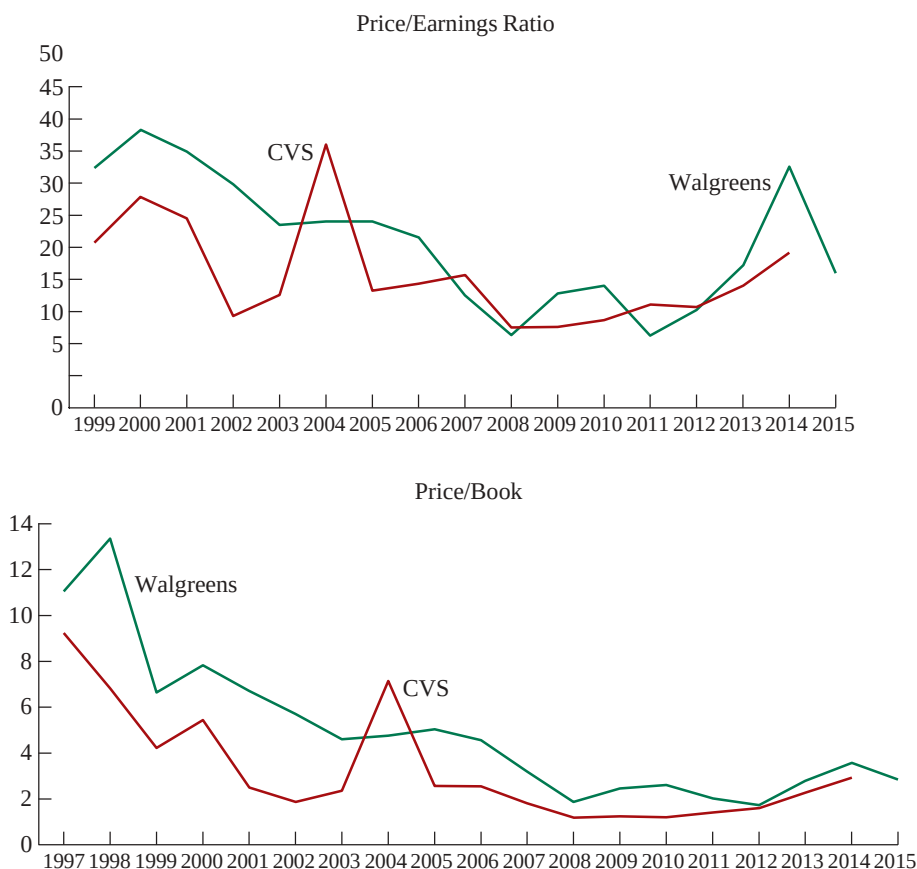
The *price-earnings*, or *P/E*, *ratio* is the market price of the firm's common stock divided by its annual earnings per share (EPS). Sometimes called the *earnings multiple*, the P/E ratio shows how much investors are willing to pay for each dollar of the firm's EPS. Earnings per share come from the income statement, so it is sensitive to the many factors that affect net income. Although EPS cannot reflect the value of patents or assets, the firm's human resources, culture, quality of management, or risk, stock prices can and do reflect all these factors. A comparison of a firm's P/E ratio to that of the stock market as a whole, or to those of the firm's competitors, indicates the market's perception of the true value of the company.

The *price-to-book-value ratio* (or price/book ratio) measures the market's value of the firm relative to balance sheet equity. The book value of equity is the difference between the book values of assets and liabilities appearing on the balance sheet.⁹ The price-to-book-value ratio is the market price per share divided by the book value of equity per share. A higher ratio suggests that investors are more optimistic about the market value of a firm's assets, its intangible assets, and its managers' abilities.

Figure 14.5 shows levels and trends in the P/E ratio and price/book ratio for Walgreens and CVS. The P/E for both firms generally declined from 2000 through the 2008–2009 Great Recession but then began to rise. At times the market gives a higher earnings multiple to Walgreens and at times a higher earnings multiple to CVS. The sharp rise in Walgreens' P/E in 2014 may have been due to optimism about the merger with Boots Alliance; its P/E decline in 2015 indicates the hoped-for synergies and profits may take longer to achieve than first expected. The price/book ratio shows a similar pattern but with Walgreens' ratio usually greater than CVS's ratio. The market appears to be less optimistic about both firms than it was ten or so years ago.

Financial managers and analysts often talk about the quality of a firm's earnings or the quality of its balance sheet. This has nothing to do with the size of a firm's earnings or assets or who audited the financial statements. Quality financial statements are those that reflect the firm's true economic condition. In other words, various accounting practices were not used to inflate the firm's earnings or assets to make the firm look stronger than it is. Thus,

FIGURE 14.5 Market Value Ratios for Walgreens



⁹Typically, it is equal to stockholders' equity.

for a quality income statement, the firm's sales revenues are likely to be repeated in the future. Earnings are not affected by one-time charges. A quality balance sheet will represent inventory that is marketable and not out of fashion or technologically obsolete. It will represent limited debt, indicating the firm could easily borrow money should the need arise. The firm's assets will have market values that exceed the accounting book values; in other words, intangible assets (such as goodwill or patents) will not inflate the firm's assets. All else constant, a firm with higher quality financial statements will have higher market value ratios. This occurs as the market will recognize and reward the economic reality of a firm's earnings and assets that are not temporarily bloated by accounting gimmicks.

Attempts to play accounting tricks will affect the firm's ratios. Overstating existing inventory can have the effect of making the current cost of goods sold appear lower, thus inflating profits. Booking revenue in advance of true sales to customers will inflate sales and profits. The effect of such actions will be to increase profitability and asset management ratios. Unfortunately, watching for accounting tricks or outright fraud is necessary for investors, as episodes have shown in recent years with companies in different industries, such as telecommunications equipment (Lucent), dot-com firms (many), and energy trading (Enron).

Summary of Ratio Analysis for Walgreens

Let's review and summarize what we've learned about Walgreens by computing its ratios and comparing them to the industry averages. The liquidity ratios show consistency over time, but the gap between Walgreens and CVS has recently increased as CVS's liquidity ratios rose while Walgreens is taking longer to pay suppliers. But the asset management ratios show Walgreens' advantage in total asset turnover and collection period has declined over time while CVS has superior fixed asset turnover and typically has higher inventory turnover.

Should Walgreens need to raise money quickly, it should be able to issue debt, as Walgreens' debt ratios are similar to CVS and its interest coverage is large as it shuns interest-bearing debt. Walgreens used to have higher profitability ratios than CVS but these have declined over time.

The stock market has recognized Walgreens trends, so now its market value ratios (price-earnings, market/book) are similar to those of CVS. Further analysis is needed to determine if Walgreens' fortunes will reverse after Walgreens and Boots Alliance integrate the two firms into one. Will Walgreens' strategy lead to better success in the future than the CVS strategy? Stock analysts will need to make that determination before they recommend which company's stock that investors should purchase. Future financial statements and market value ratios will show who is right!