



Analysis of Financial Statements Using Ratios

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1. Introduction to Financial Management

Financial management is a critical internal process for organizations. With today's challenges and regulations, to the management of every organization (profit or nonprofit) needs to have an understanding of the basics of financial management to ensure that the organization is fiscally responsible. The understanding of financial management practices and the construction of basic systems and practices are the foundation for a healthy/sustainable organization.

Financial management covers the following aspects:

- **Financial statement analyses:** These include income, balance sheet, and cash flow statements.
- **Capital budgeting:** These techniques and methods compare different investment alternatives and usually include the analysis of future cash flows (negative and positive).
- **Taxation.**
- **Legal considerations:** Organizations might engage in various public activities such as lobbying, advocacy, contracts, risk management, and public support.
- **Accounting:** Bookkeeping systems require that certain standards are followed to develop and report financial transactions.
- **Sustainability:** The ability of a firm to develop strategies for growth and development.

In this publication we cover the basics of using ratio analysis to analyze financial statements. Horizontal and vertical analyses are other common techniques to compare and analyze financial statements from different reporting periods.

There are three main financial statements that need to be understood to evaluate the financial condition, profitability, and cash flows of any organization: the balance sheet, the income statement, and the cash flow statement. This publication covers the fundamental concepts to construct and analyze these critical financial statements.

2. The Balance Sheet

This statement shows the financial condition of a company for a particular period or date. It has three major sections: assets (resources of the company), liabilities (debts of the company), and stockholders' equity (the owners' interest in the firm). For any given period in the balance sheet, total assets must equal the total amount of the contributions of the creditors and owners. This is expressed in the accounting equation

Assets = liabilities + stockholders' equity.

Figure 1 presents a typical balance sheet for a furniture company.*

2.1 Assets

HAVERTY FURNITURE				
Data Year - Fiscal	2009	2010	2011	
Assets				
Current Assets				
Cash and Short-Term Investments	44.466	58.045	56.398	
Receivables - Total	15.299	13.778	11.451	
Inventories - Total	93.301	91.938	93.713	
Current Assets - Other - Total	15.235	13.174	16.113	
Current Assets - Total	168.301	176.935	177.675	
Long term Assets				
Property, Plant and Equipment - Total (Net)	176.363	175.511	179.333	
Depreciation, Depletion and Amortization (Accumulated)	200.002	208.854	213.79	
Investment and Advances - Equity	0	0	0	
Investment and Advances - Other	0.844	0.588	0.449	
Intangible Assets - Total	0	0	0	
Assets - Other	15.425	17.205	27.643	
Assets - Total	360.933	370.239	385.1	
Liabilities				
Current liabilities				
Debt in Current Liabilities - Total	0.357	0.525	0.762	
Accounts Payable - Trade	19.128	18.088	18.233	
Income Taxes Payable	0	0	0	
Current Liabilities - Other - Total	51.96	51.994	53.378	
Current Liabilities - Total	71.445	70.607	72.373	
Long term liabilities				
Long-Term Debt - Total	6.826	8.574	12.284	
Deferred Taxes and Investment Tax Credit	0	0	0	
Liabilities - Other - Total	38.105	37.876	37.774	
Liabilities - Total	116.376	117.057	122.431	
Noncontrolling Interest (Balance Sheet)	0	0	0	
Stockholder's equity				
	0	0	0	
	244.557	253.182	262.669	
	244.557	253.182	262.669	

Figure 1. Balance sheet for Haverty Furniture (in millions of dollars).

Assets are future economic benefits obtained or controlled by an entity as a result of past transactions or events. They could be physical (land, buildings, equipment) or intangible (patents or trademarks). Assets are divided into current assets and long-term assets. **Current assets** are cash or assets that can be turned into cash in less than one year. Current assets are related to the liquidity (ability to convert to cash) of the company. Some examples are cash, marketable securities (government bonds, common stock, or certificates of deposit), short-term receivables, inventories, and pre-pays (taxes, hazard insurance, or special assessments).

Long-term assets take more than one year or one operating cycle to turn into cash, and they are usually divided into tangible assets, investments, intangible assets, and other. **Depreciation** is one example of a long-term asset. Depreciation is the process of allocating the cost of buildings and machinery over the time periods in analysis. The most common method to calculate depreciation is called the straight-line method. The formula is

$$\text{Annual depreciation} = \frac{(\text{cost} - \text{salvage value})}{\text{estimated life.}}$$

*Wharton Research Data Services was used in preparing this manuscript. The service and the data available thereon constitute valuable intellectual property and trade secrets of WRDS and/or its third-party suppliers.

Another type of long-term asset is **investments**, which are usually stocks and bonds of other companies that are held to maintain a business relationship or exercise control. Examples of intangible assets include patents, trademarks, franchises, organizational costs, and copyrights.

	Fiscal year		
Revenues	2009	2010	2011
Sales turnover (net)	589.474	621.048	621.363
Cost and expenses			
Cost of goods sold	263.42	284.705	281.945
Selling, general and administrative expense	311.501	312.277	316.032
Operating income before depreciation	14.553	24.066	23.386
Operating income after depreciation	-4.793	7.207	5.144
Interest and related expenses	0.981	0.949	0.845
Nonoperating income (expense)	0.366	2.415	0.304
Pretax income	-5.408	8.673	4.603
income taxes	-1.229	0.229	-10.86
Income before extraordinary items	-4.179	8.444	15.463
Net income adjusted for common ordinary stock	-4.179	8.444	15.463
Earnings per share	-0.2	0.39	0.71
Earnings per share	-0.2	0.38	0.7

Figure 2. Income statement in single-step format for Haverty Furniture (in millions of dollars).

2.2 Liabilities

Liabilities are future sacrifices arising from present obligations of a particular entity to transfer assets or provide services to other entities. Similar to assets, liabilities are classified into current and long-term liabilities. **Current liabilities** require liquidation of current existing assets within one year or cycle period. They include the payables, unearned income (payments collected in advance), and other current liabilities.

Long-term liabilities refer to obligations that are due later than one year or operating cycle — whichever is longer. There are two general types: financing arrangements and operational obligations. Financing arrangements might include

- Notes payable: Promissory notes due in periods of greater than one year or operating cycle.
- Bonds payable: Debt securities.
- Credit arrangements: Loan commitments with banks or insurance companies.

Long-term liabilities related to operational obligations include obligations arising from operation of a business, pension obligations, postretirement obligations, deferred taxes, and service warranties.

Deferred taxes result from using different accounting methods for tax and reporting systems. For example, a company might use accelerated depreciation for tax purposes and straight-line depreciation for reporting purposes. This causes tax expenses for reporting purposes to be higher than taxes payable according to the tax return. The difference is considered deferred tax.

2.3 Stockholders' Equity

Stockholders' equity is the residual ownership interest in the assets of an entity that remains after deducting its liabilities and is usually divided in two basic categories: paid-in capital and retained earnings.

Paid-in capital could be preferred or common. **Retained earnings** are the undistributed earnings of the corporation (the net income for all past periods minus the dividends that have been declared).

3. The Income Statement

An income statement summarizes revenues and expenses, and gains and losses. It ends with the net income for a specific time or period. Two common formats to present an income statement are the **multiple-step** and the **single-step** income statement. In the first case, gross profit, operating income, income before taxes, and net income are presented separately. In the second case, total revenues and gains are presented, and then expenses and losses are deducted. Figure 2 shows an income statement for Haverty Furniture in single-step format.

The **net sales** or sales turnover represents revenue from goods or services sold to customers. Sales are usually shown net of any discounts, returns, or allowances. Depending on the type of operations of the firm, there might be **other revenue** such as lease revenue or royalties.

The **cost of goods sold** or cost of sales shows the costs to produce revenue. In a retail firm, this represents the beginning inventory plus purchases minus the ending inventory. In manufacturing, the COGS replaces purchases because the goods are produced (raw material, labor, and overhead) rather than purchased. A service firm will have no COGS but a cost of services instead. Table 1 shows how the COGS is calculated for a retail business.

Table 1. Calculation of the cost of goods sold for a retail business.

Item	Amount
Beginning inventory	200
Plus purchases	+ 800
Subtotal	1,000
Minus ending inventory	- 400
COGS	600

Figure 3 shows how to calculate the COGS for a manufacturer. Notice that you need to divide the materials into raw, work in process, and finished goods inventories. Similar to a retailer, there will be beginning and ending inventories for each type of inventory. The difference from a retailer is that labor and other costs (known as overhead) will be added to the cost of the raw materials.

In figure 3 at the end of the analyzed period, a total of \$125 worth of materials (see Raw Materials column) was moved to the work in process inventory (Work in Process column). Notice that no labor or other costs were added to raw materials because this is just a warehouse operation. In the Work in Process column, there is also a beginning and ending inventory, but we also have to consider the materials moved from the Raw Materials column (\$125), the labor (\$40), and overhead or other cost (\$10). A similar logic is applied to the finished goods inventory (Finished Goods column), where \$225 worth of materials comes from the work in process inventory. As with the raw materials inventory, no labor or overhead is added to the product in the finished goods inventory. The final calculation for the COGS is the number shown circled in the Finished Goods column, which is the finished product that it was **sold**.

Calculating Cost of Goods Sold for a Manufacturer				
(\$)	Raw Materials	Work in Process	Finished Goods	
Beginning Inventory	→ 50	→ 75	→ 100	
Purchases	→ 150	→ 125	→ 225	
Labor used	0	→ 40	→ 0	
Other cost	0	→ 10	→ 0	
Total cost	→ 200	→ 250	→ 325	
Materials used	→ 125	→ 225	→ 175	
Ending inventory	→ 75	25	150	

Figure 3. Calculation of cost of goods sold for a manufacturer.

There are two types of operating expenses: selling and administrative. **Selling expenses** result from the efforts of the firm to create sales and include advertising, sales commissions, sales supplies, etc. **Administrative expenses** relate to the general management of the company's operation, such as salaried office employees, insurance, telephone, bad debt expense, and other costs difficult to allocate to the firm's main products.

Non-operating income is any income or expense resulting from secondary business-related activities, excluding those considered part of the normal operations of the business. They could include dividend income, rental income, royalty income, foreign exchange adjustments, moving expenses, and others. **Special items** comprises unusual or nonrecurring items presented before taxes by the firm. This might include flood, fire, other natural disaster losses, inventory write-downs, reserve for litigation, and others. **Pretax income** is composed of operating and non-operating income before provisions for income taxes and minority interests.

Income taxes include all income taxes imposed by federal, state, and foreign governments. **Net income adjusted for common ordinary stock (capital) equivalent** represents the company's net income available to common shareholders after preferred dividend requirements have been met. **Earnings per share (basic)** is basic earnings per share before extraordinary items and discontinued operations, and **earnings per share (diluted)** is basic earnings per share for common shares after allowing for the conversion of convertible senior stock and debt and the exercise of warrants and other items.

4. The Cash Flow Statement

The **cash flow** statement includes not only cash, but also short-term, highly liquid investments. The cash flow statement examines all the accounts on the balance sheet to explain changes in these accounts. It is used to determine dividend policy, cash generated by operations, and investing and financing policy. Outsiders might use the cash flow statement to determine the firm's ability to increase dividends, its ability to pay debt with cash from operations, and the percentage of cash from operations in relation to the cash from financing.

The cash flow statement classifies each receipt and cash payment into operating, investing, and financing activities. **Operating activities** usually involve income statement items, and **investing activities** involve long-term asset items. **Financing activities** are related to long-term liability and stockholders' equity items. Some of the typical cash flow items by categories are shown below.

Operating activities

- Cash inflows:
 - Income.
 - Return on loans.
 - Return on equity securities.
- Cash outflows:
 - Acquisition of inventory.
 - Payments to employees.
 - Taxes.
 - Interest expense.
 - Payment to supplier.

Investing activities

- Cash inflows:
 - Receipts from loans collected.
 - Sales of debt or equity securities.
 - Sales of property, machinery, or other.

- Cash outflows:
 - Loans from banks.
 - Purchase of debt or equity securities.
 - Purchase of property, machinery, or other.

Financing activities

- Cash inflows:
 - Sale of equity securities.
 - Sales of bonds, mortgages, notes, and other short- or long-term borrowings.
- Cash outflows:
 - Payment of dividends.
 - Reacquisition of the firm's capital stock.
- Payment of amounts borrowed.

The cash flow statement presents cash flow from operating activities first, followed by investing activities, and then financing activities. The cash flow statement can be presented using the direct or indirect method. In the **direct method**, the income statement is presented on a cash basis. In the **indirect method**, net income is adjusted for items that affected the net income but did not affect cash.

Figure 4 shows a cash flow statement using the indirect method, where the income is adjusted accordingly. Notice that items can be shown as a decrease (negative) or increase (positive) in cash. For instance, the item **Inventory** in the Operating Activities section) is positive for 2009 and 2010 but negative for 2011. This means that in 2009 and 2010 the company decreased the size of the inventory, generating more cash. On the contrary, in 2011 the company increased the size of the inventory impacting the cash flow by $-\$1.775$ million.

In figure 4's Operating Activities section, the items **Income before extraordinary items** and **Depreciation and amortization** are taken directly from the income statement (fig. 2; just as **Accounts Receivable** and **Inventory** are taken from fig. 1). Other items in this section, such as **Accounts Payable and Accrued Liabilities**; **Sale of Property, Plant, and Equipment and Investments**; and **Funds from Operations** might require additional information that was not specifically shown in the balance sheet (fig. 1) or the income statement (fig. 2).

Items in the Investing Activities section (fig. 4) are not straightforward and require additional information. They are not taken directly from either the **balance sheet** or the **income statement** but from other company records such as **stock statements, investments, and loans**.

Haverty Furniture				
Operating activities	2009	2010	2011	
Income before extraordinary items	-4.179	8.444	15.463	
Depreciation and amortization	19.346	16.859	18.242	
Deferred taxes	-2.2	-2.953	-7.942	
Sale of property, plant and equipment and investments	-0.021	-1.653	0.094	
Funds from operations	3.353	1.468	2.464	
Accounts receivable change	9.263	1.397	2.299	
Inventory change	10.442	1.363	-1.775	
Accounts payable and accrued liabilities change	-2.351	0.155	0.959	
Assets and liabilities change	4.842	-0.879	-10.727	
(1) Total cash from operating activities	38.495	24.201	19.077	
Investing activities				
Short-term investments change	0	0	-6.813	
Capital expenditures	-3.259	-14.053	-17.566	
Sale of property	6.656	2.856	0.157	
Investing activities -Other	0.043	0	0	
(2) Total cash flow for investing activities	3.44	-11.197	-24.222	
Financing activities				
Sale of Common and Preferred stock	0.092	3.319	0.285	
Cash Dividends	-0.473	-2.168	-2.609	
Long-term debt reduction	-0.311	-0.385	-0.588	
Financing activities -other	-0.474	-0.191	-0.398	
(3) Total cash from from financing activities	-1.166	0.575	-3.31	
Total cash flow (1+2+3)	40.769	13.579	-8.455	

Figure 4. Cash flow for Haverty Furniture (in millions of dollars).

5. Financial Statement Analysis Basics

Financial statement analysis involves techniques to compare financial data and to evaluate the position of a company. These techniques include ratio analysis, common-size analysis, comparisons across companies, trend analysis, and year-to-year analysis. It is important to mention that ratios vary between industries. For example, a company in the furniture industry should only compare against benchmarks in its own industry. In this paper, financial data from Haverty Furniture (a publically traded company) is used to illustrate the concepts.

5.1 Liquidity Ratios

Liquidity ratios are a measure a firm's ability to meet its current obligations. Maintaining a short-term paying ability is critical for any organization and even a profitable company might become bankrupt if short-term obligations are not honored. When analyzing short-term paying capacity, there is a close relationship between current assets and current liabilities that needs to be understood. In general, current liabilities will be paid with cash generated from current assets. The following section addresses some of the most important liquidity ratios to help analyze the short-term paying capacity of any firm.

- **Days' sales in receivables** is calculated as

$$\text{Days' sales in receivables} = \frac{\text{gross receivables}}{\text{gross receivables}/(\text{net sales}/365)}.$$

The result of this ratio should be equal to or less than the credit term of the firm. For example, if the credit term is 30 days, the days' sales receivables should not be over 30 days. If it is bigger, the company might have a collections problem. If we calculate this ratio for Haverty Furniture for 2009, the result is 104.2 days. Because we don't know what the company's credit term is, it is difficult to estimate if there is a collections problem. However, we could calculate the ratio for 2010 and 2011. The results indicate that for 2010, the days' sales receivable ratio is 104.0 days, and for 2011, it is 104.4. As we can see 2010 and 2011 were very similar to 2009.

- **Accounts receivable turnover in days:** This ratio indicates the liquidity of the receivables. The formula is

$$\text{Accounts receivable turnover in days} = \frac{\text{average gross receivables}}{(\text{net sales}/365)}.$$

This ratio should be as small as possible to indicate that the organization has a quick turnaround to collect money from its customers.

- **Days' sales in inventory:** This ratio gives an indication of the length of time it will take to use up the inventory through sales. The calculation is as follows:

$$\text{Days' sales in inventory} = \frac{\text{ending inventory}}{(\text{cost of goods sold}/365)}.$$

For Haverty Furniture, this ratio is 129.3, 117.9, and 121.3 days for 2009, 2010, and 2011, respectively. This indicates that in 2009, it took 129.3 days for the company to sell its inventory. This time decreased in 2010 but increased in 2011.

Table 2. Liquidity ratios for Haverty Furniture.

Ratios	Year		
	2009	2010	2011
Days' sales receivable	104.2	104.0	104.4
Accounts receivable turnover in days	9.5	8.1	6.7
Days' sales in inventory	129.3	117.9	121.3
Inventory turnover	2.8	3.1	3.0
Inventory turnover in days	129.3	117.9	121.3
Operating cycle	138.8	126.0	128.0
Working capital	96.9	106.3	105.3
Current ratio	2.4	2.5	2.5
Acid test ratio	1.0	1.2	1.2

- **Inventory turnover:** This ratio indicates liquidity of the inventory. The formula is

$$\text{Inventory turnover} = \frac{\text{cost of goods sold}}{\text{average inventory.}}$$

The quicker the company turns its inventory, the more liquidity the company has. Calculations of this ratio for 2009, 2010, and 2011, indicated in table 2, show that the company turned its inventory faster in 2011 than 2009.

The inventory turnover can be also calculated in days by using the following formula:

$$\text{Inventory turnover in days} = \frac{\text{average inventory}}{(\text{cost of goods sold}/365)}.$$

As we can see from table 2, the inventory turnover in days has decreased when comparing 2011 with 2009.

- **Operating cycle:** This ratio is important for measuring the time between the acquisition of goods and the final cash realization resulting from sales and subsequent collections. The formula is

$$\text{Operating cycle} = \text{accounts receivable turnover in days} + \text{inventory turnover in days.}$$

As table 2 shows, the company is taking less time now to realize cash from inventories (from 138.8 days in 2009 to 128.0 days in 2011). For some industries this length of time still could be considered long and could negatively impact the cash flow of the company. The bottom line here is to realize cash as fast as possible.

- **Working capital:** This ratio is an indication of the short-run solvency of the business, and it is calculated as

$$\text{Working capital} = \text{current assets} - \text{current liabilities.}$$

From table 2, we can see that Haverty Furniture is increasing its working capital. Financial institutions or lenders would like to see a large difference between current assets and current liabilities. The bigger the difference (working capital), the greater capacity the company would have to repay a loan.

- **Current ratio:** This ratio determines the short-term paying ability. It is calculated as

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

- In general, 2.0 has been considered a good current ratio. However, today many companies have current ratios under 2.0, potentially indicating a decline in liquidity. Typically, the shorter the operating cycle, the lower the current ratio, although in our example it does not seem that way. See table 2 and compare the current ratio with the operating cycle.
- **Acid test ratio:** This is similar to the current ratio, but the inventories are removed. The reason is that, in some cases, inventory could move so slowly that it risks becoming obsolete. The formula to calculate this ratio is

$$\text{Acid test ratio} = \frac{(\text{current assets} - \text{inventory})}{\text{current liabilities.}}$$

In the case of Haverty Furniture, we can see from table 2 that the acid test ratio was 1.0, 1.2, and 1.2 for 2009, 2010, and 2011. An increase in the acid test ratio might indicate that the company is working toward the elimination of inventories.

Overall, liquidity ratios are perhaps the best way to determine the capacity of a business to repay a loan. When asking for credit from lenders, liquidity ratios play a critical role and any manager needs to understand these relationships. Lenders will not necessarily look at every liquidity ratio explained here, but a business manager must be aware of how these ratios are calculated and their particular meaning.

5.2 Debt Ratios

Debt ratios are a measure of the degree of protection for suppliers of long-term funds. The amount of debt compared to the size of the firm should be analyzed. This analysis provides insights regarding the amount of funds provided by outsiders. A large proportion of debt in capital structure increases the risk of not meeting the principal or interest obligation because the company might not be generating enough cash to meet its obligations. Some of the most important debt or borrowing ratios are explained as follows.

Table 3. Debt ratios for Haverty Furniture.

Ratios	Year		
	2009	2010	2011
Debt ratio	0.32	0.32	0.32
Debt/equity ratio	0.48	0.46	0.47
Debt to tangible net worth ratio	0.48	0.46	0.47

- **Debt ratio:** This ratio indicates the firm's long-term debt-paying ability. It is calculated as

$$\text{Debt ratio} = \frac{\text{total liabilities}}{\text{total assets.}}$$

Calculations of the debt ratio for Haverty Furniture for the three periods in analysis show that the ratio is practically the same for all periods (see table 3). In summary, the debt ratio in this particular case indicates that 32% of the firm's assets are financed by creditors. This ratio can be used to compare one company to others. If creditors decide that a company owes too much, they might reject additional long-term financing.

- **Debt/equity ratio:** This ratio determines a firm's long-term debt-paying ability. The lower this ratio, the better the company's debt position. It is calculated as

$$\text{Debt/equity ratio} = \frac{\text{total liabilities}}{\text{shareholder's equity.}}$$

Similar to the debt ratio, the debt/equity ratio has the same objective. We can see from table 3 that the debt/equity ratio for our case study firm has been decreasing from 2009 to 2011, which is an indication of good performance.

- **Debt to tangible net worth ratio:** This ratio is a more conservative way to determine the firm’s long-term debt-paying capacity. This ratio removes intangible assets from the calculation. Items such as goodwill, trademarks, patents, and copyrights are considered intangible assets, and they might not provide enough resources to creditors. The formulation used for this ratio is

$$\text{Debt to tangible net worth ratio} = \frac{\text{total liabilities}}{(\text{shareholders' equity} - \text{intangible assets})}$$

As shown in table 3, this particular ratio is the same as the debt/equity ratio because the company does not report any intangible assets (see fig. 1).

5.3 Profitability Ratios

Profitability ratios are a measure of the earning ability of a firm. Profitability ratios are vital for stockholders because they derive revenue in the form of dividends. They are also critical for creditors because profits are one source of funds for debt coverage. Additionally, managers use profit as a way to measure performance. Profitability measures should only include the type of income arising from the normal operations of the firm. The main profitability ratios are

- **Net profit margin:** A commonly used ratio to report return on sales. It is calculated as

$$\text{Net profit margin} = \frac{\text{net Income before extraordinary items}}{\text{net sales}}$$

Table 4. Profitability ratios for Haverty Furniture.

Ratios	Year		
	2009	2010	2011
Net profit margin	-0.7%	1.4%	2.5%
Total assets turnover	1.63	1.68	1.61
Return on assets (ROA)	-1.2%	2.3%	4.0%
Return on investment (ROI)*	-0.3%	0.7%	1.2%
Return on equity (RTE)	-1.7%	3.3%	5.9%
*Tax rate per year	30.0%	30.0%	30.0%

From table 4, we can see that this ratio was negative in 2009, indicating a poor profit performance. However, the company showed signs of recovery in 2010 and 2011, where the net profit was 1.4% and 2.5%. A good way to know if the net profit margin is acceptable is to compare it against interest rates offered by financial institutions or long-term investments in the stock market. For example, if a financial institution offers a 2% annual interest rate for a certificate of deposit, the earnings per month are $2\%/12 = 0.17\%$. Any business that can generate more than 0.17% in net profit margin on a monthly basis is considered a better investment than putting the money in a bank.

- **Total asset turnover:** This ratio measures the activity of the assets and the capacity of the company to produce sales by the use of its assets. To compute this ratio, we use the following formula:

$$\text{Total asset turnover} = \frac{\text{net sales}}{\text{total assets}}$$

Total asset turnover is a profitability ratio oriented to measure the ability of the company to use its assets to generate revenue. The higher the ratio, the more efficient the company is in generating revenue from its assets. The total asset turnover ratio indicates how much money the company makes for every dollar invested. In the case of Haverty Furniture, we can see that for 2009, 2010, and 2011, this ratio yielded 1.63, 1.68, and 1.61 (table 4). For

example, for 2010, a total asset turnover ratio of 1.63 means that for every dollar invested in the company, 63 cents were generated. There is no particular threshold when using this ratio, but in general a number above 1.5 is good sign of profitability.

- **Return on assets:** This ratio measures the company's ability to create profits by comparing profits with the assets that generate the profits. The formula to calculate this ratio is

$$\text{ROA} = \frac{\text{net income before extraordinary items}}{\text{total assets.}}$$

ROA is similar to total asset turnover, but it removes expenses from the revenue. It is perhaps a better indication of operational efficiency and profitability than total asset turnover. There could be cases where a company has a very good total asset turnover ratio, but its ROA is very poor. On the contrary, another company could have a poor total asset turnover ratio but a very good ROA ratio. Investors usually prefer the ROA ratio because it shows how efficient businesses are at using assets to generate profit, not just revenue. Ultimately, it is profit that leads the way to increase earnings per share.

Using data from our case study company, we can see this ratio was -1.2%, 2.3%, and 4.0%. It appears as though the company improved its profitability since 2009 (see table 4).

- **Return on investments:** This ratio measures the income earned on the invested capital. It is calculated as

$$\text{ROI} = \frac{(\text{net income before extraordinary items} + \text{interest expense} \times (1 - \text{tax rate}))}{(\text{long-term liabilities} + \text{equity}).}$$

The ROI ratio is used to evaluate the firm's performance regarding its ability to reward those who provided long-term funds and to attract providers of future capital. Managers and investors like to use ROI to measure particular investments. For example, a manager would like to know what the expected ROI is for buying a new piece of equipment or expanding operations for a particular facility. For our case study (table 4), we can see that Haverty Furniture's ROI has increased from -0.3% in 2009 to 1.2% in 2011, indicating that the company is on a positive trend.

- **Return on total equity:** The ROE measures the return to both common and preferred stockholders. This ratio is as follows:

$$\text{ROE} = \frac{\text{net income before extraordinary items}}{\text{total equity.}}$$

ROE measures financial performance by dividing net income by the shareholders' equity. It could be thought of as return on net assets because shareholder's equity is assets minus debt. ROE could be interpreted as a measure of how effectively the managers of a company are using assets to generate profit. From table 4, we can see that in 2009, the ROE was negative, and for years 2010 and 2011, it was 3.3% and 5.9%, respectively.

5.4 Other Financial Ratios

There are other financial ratios that can help investors make investment decisions. Other ratios can be developed with items from the cash flow statements. However, those ratios are not covered in this publication.

6. Final Comments

Financial statement analysis is a management technique that should be understood by all management team members for any business organization. Ensuring that an organization is making appropriate use of its assets is a key factor for success. Additionally, it guarantees that customers and suppliers are receiving fair treatment in terms of a business being able to meet financial obligations and payment terms.

One caveat of financial statement analysis is that it might not be an appropriate tool to monitor the day-to-day operations of an organization. A good practice for most business organizations would be to develop a monthly financial statement analysis; however it could be too late to react to issues such as underperformance. Additional economic analysis tools such as cost allocation and tracking might be needed if the organization needs to monitor asset utilization (machine utilization, labor usage, and raw material consumption) in real time. Information technologies such as enterprise resource planning software might offer options to monitor asset utilization as products and services are being produced in the organization.

In the following pages, we present several exercises that can be used to test the reader's knowledge of financial statement analysis.

7. Exercises

Exercise 1

The cost of goods sold (COGS) in a manufacturing company refers to:

1. Raw material, direct labor, and overhead.
2. Administrative salaries, raw materials, and interest and taxes.
3. Interest and taxes, raw materials, and overhead.
4. None of the above.

Exercise 2

Table 5. Profitability ratios for Haverty Furniture.

Activity	2006	2007
Sales	295,500	325,109
Investment in equipment (brand new)	85,000	0
Production wages	126,720	13,520
Material purchases	43,890	50,781
Other materials (paint, glue, hardware)	14,521	16,752
Administrative salaries	35,040	40,020
Accounts payable	35,215	26,541
Accounts receivable	45,001	40,521
Loan from bank	100,000	0
Inventories	75,880	85,612
Interest expenses	11,526	10,501
Building rent	6,000	6,500
Amortization	6,500	9,500
Other expenses (water, electricity, phone)	14,500	16,500
Cash in bank	35,251	42,511
Sale of common stock	25,000	12,000

Prepare an income statement with the information shown in table 5 for 2006 and 2007. Consider that equipment depreciates linearly over a span of 10 years with a surplus value of \$15,000. The firm is taxed at a 5% rate each year.

Exercise 3

Use the information and results of exercise 2 to develop a balance sheet for 2006 and 2007.

Exercise 4

Use the information and results from exercises 2 and 3 and develop cash flow statements for 2006 and 2007.

Exercise 5

1. Using the results from exercises 2, 3, and 4, calculate the following financial ratios:

- Current ratio.
- Quick ratio.
- Working capital.
- Debt/net worth.
- ROA.
- ROE.
- Inventory turn over.
- Accounts receivables turnover in days.
- Net profit margin.
- ROI.

2. Write an analysis of the company based on its liquidity, profitability, and debt capacity.

Exercise 6

If the operating cash flow is less than the net profit, it means that

1. The company is not able to turn its sales into cash.
2. The company is not able to pay its short-term debts or liabilities.
3. The company does not have any inventory left.
4. None of the above.

Exercise 7

A hardwood flooring manufacturer has collected the information presented in table 6.

Table 6. Financial information for a hardwood flooring manufacturer.

Item	Amount	Item	Amount
Sales	325,000	Taxes paid	14,000
Dividends per share	1.55	Cash in hand	45,000
Interest	11,500	Share price	12.46
Cost of goods sold	125,000	Accounts receivable	75,000
Building rent	12,000	Old equipment sell out	64,500
Marketing expenses	15,000	Equipment	450,000
Administrative salaries	30,000	Accounts payable	140,000
Inventory on hand	275,000	Loan from bank	650,000
Depreciation	35,000	Purchase of ERP system	25,000

Prepare the following items:

1. Income statement.
2. Balance sheet statement.
3. Financial ratios:
 - Current ratio.
 - Quick ratio.
 - Inventory turnover.
 - Debt ratio.
 - Return on assets.

Exercise 8

Revise figure 5. What is the net profit margin?

1. 40.8%
2. 5.89%
3. 8.45%
4. None of the above.

	2000
Sales	\$ 190,554
Cost of goods sold	\$ 77,741
Gross profit	\$ 112,813
Selling, general, and administrative expense	\$ 90,377
Operating income before depreciation	\$ 22,436
Depreciation, depletion, and amortization	\$ 6,316
Operating profit	\$ 16,120
Nonoperating income/expense	\$ 2,930
Pretax income	\$ 19,050
Total Income taxes	\$ 7,811
Net income	\$ 11,239

Figure 5. Financial data.

Exercise 9

Revise the data in figure 6. Prepare a financial analysis of the liquidity and debt performance of the company. Indicate if the firm's performance in these two dimensions improved from 2008 to 2010. Remember to calculate and use financial ratios to justify your answer. With the information in figure 6, can you comment on the profitability of the firm?

FURNITURE BRANDS INTL INC

Data Year - Fiscal	2008	2009	2010
Assets			
Cash and Short-Term Investments	106.58	83.872	51.964
Receivables - Total	216.68	184.489	114.535
Inventories - Total	350.026	226.078	249.691
<i>Current Assets - Other - Total</i>	<i>12.592</i>	<i>9.274</i>	<i>11.242</i>
<i>Current Assets - Total</i>	<i>685.878</i>	<i>503.713</i>	<i>427.432</i>
Property, Plant and Equipment - Total (Net)	150.864	134.352	124.866
Depreciation, Depletion and Amortization (Accumulated)	334.596	318.896	294.768
Intangible Assets - Total	127.3	87.608	86.508
Assets - Other	35.476	32.432	37.607
Assets - Total	999.518	758.105	676.413
Liabilities			
Debt in Current Liabilities - Total	30	17	0
Accounts Payable - Trade	85.206	83.813	79.846
Current Liabilities - Other - Total	112.296	75.948	61.223
<i>Current Liabilities - Total</i>	<i>227.502</i>	<i>176.761</i>	<i>141.069</i>
Long-Term Debt - Total	160	78	77
Deferred Taxes and Investment Tax Credit	27.917	25.737	23.114
Liabilities - Other - Total	217.605	214.816	175.663
<i>Liabilities - Total</i>	<i>633.024</i>	<i>495.314</i>	<i>416.846</i>
Stockholder's equity			
Stockholders Equity - Parent	366.494	262.791	259.567

Figure 6. Financial data for Furniture Brands Intl. Inc. (\$ millions), taken from Wharton Research Data Services.

Exercise 10

An international lumber broker is preparing a business plan to start exporting U.S. hardwood lumber to India. Figure 7 shows the balance sheet for the project for the first five years. Answer the following questions:

1. In year 1, the ratio of net profit to accounts receivable is 74.9%, and for year 5 the same ratio is 89.7%. Why might this be a negative issue for the company?
2. In year 1, the equipment value is \$552,000, and in year 5, the value of equipment is \$320,000. Why did the value decrease? Explain clearly.
3. Calculate the debt/net worth ratio for years 1, 2, and 3. What does this result mean? Do you see a positive or negative trend?
4. Calculate the current and quick ratios for year 1. Compare the ratios and explain the difference between the two. Why is the quick ratio considered a better measurement of a firm's liquidity?

PROJECTED BALANCE SHEET						
Assets						
Current assets		Y1	Y2	Y3	Y4	Y5
	Cash	\$ 943,598	\$ 1,198,060	\$ 1,508,084	\$ 1,885,492	\$ 2,344,572
	Accounts receivable	\$ 1,260,000	\$ 1,512,000	\$ 1,814,400	\$ 2,177,280	\$ 2,612,736
	Inventory	\$ 345,600	\$ 414,720	\$ 497,664	\$ 597,197	\$ 716,636
total curent assets		\$ 2,549,198	\$ 3,124,780	\$ 3,820,148	\$ 4,659,968	\$ 5,673,944
Long term assets						
	Equipment	\$ 552,000	\$ 494,000	\$ 436,000	\$ 378,000	\$ 320,000
total long term assets		\$ 552,000	\$ 494,000	\$ 436,000	\$ 378,000	\$ 320,000
total assets		\$ 3,101,198	\$ 3,618,780	\$ 4,256,148	\$ 5,037,968	\$ 5,993,944
Liabilities						
current liabilities						
	Account payable	\$ 288,450	\$ 345,315	\$ 413,429	\$ 495,024	\$ 592,774
total current liabilities		\$ 288,450	\$ 345,315	\$ 413,429	\$ 495,024	\$ 592,774
long term liabilities						
	Bank loan	\$ 415,040	\$ 322,579	\$ 222,619	\$ 115,159	\$ 198
Total long term liabilities		\$ 415,040	\$ 322,579	\$ 222,619	\$ 115,159	\$ 198
Total liabilities		\$ 703,490	\$ 667,894	\$ 636,048	\$ 610,183	\$ 592,972
Networth		\$ 2,397,708	\$ 2,950,885	\$ 3,620,100	\$ 4,427,786	\$ 5,400,971
Total liabilities+networth		\$ 3,101,198	\$ 3,618,780	\$ 4,256,148	\$ 5,037,968	\$ 5,993,944

Figure 7. Balance sheet for a lumber business exporting to India.