# Analysis of Financial Statements using Ratios

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**February 2019**

**Content**

## 1. Introduction to Financial Management

Financial management is a critical internal process for organizations. With today's challenges and regulations, every organization (profit or non-profit) needs to have an understanding of the basics of financial management to ensure that their organization is fiscally responsible. The understanding of financial management practices and 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 following certain standards 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, the income, and the cash flow statements. In this publication, we will cover 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 the stockholders' equity (the owners' interest in the firm). For any given period of the balance sheet, the 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.

| 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)[1]

## 2.1 Assets

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 in **current assets** in the form of cash or assets that can be turned into cash in less than one year. Current assets are related to the liquidity

[1] 'Wharton Research Data Services (WRDS) was used in preparing this manuscript titled "Analysis of Financial Statements using Ratios". This service and the data available thereon constitute valuable intellectual property and trade secrets of WRDS and/or its third-party suppliers.

(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 prepaids (taxes, harzard 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:

**Annual Depreciation = (Cost-Salvage Value)/Estimated Life**

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

## 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 over 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 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.

| | 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).

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.

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

| **Item** | **Amount** |
|---|---:|
| Beginning Inventory | $200 |
| Purchases | +$800 |
| Subtotal | $1,000 |
| Minus Ending Inventory | -$400 |
| COGS | $600 |

The **cost of goods sold** (COGS) 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 since the goods are produced (raw material, labor and overhead) rather than purchased. A service firm will have no COGS but cost of services instead. Table 1 shows how the COGS is calculated for a retail business.

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.

**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 COGS for a manufacturer.

In Figure 3 at the end of the analyzed period a total of $125 worth of materials (see column Raw Materials) were moved to the work in process inventory (column Work in Process).

Notice that no labor or other costs were added to raw materials because this is just a warehouse operation. In the column Work in Process, 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 (column Finished Goods) where $225 worth of materials come 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 column Finished Goods which is the finished product that it was **sold**.

There are two types of operating expenses: **selling and administrative**. Selling expenses result from the efforts of the firm to create sales such as: 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** represents 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** represent unusual or nonrecurring items presented before taxes by the firm. This might include: flood, fire, or other natural disaster losses, inventory write downs, reserve for litigation, and others.

**Pretax income** represents operating and non operating income before provisions for income taxes and minority interests.

**Income taxes** represent 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)** represents 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 is cash that includes not only cash itself 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. The cash flow statement 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 flows statement presents cash flows 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.

**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).

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 section Operating Activities (Figure 4) is positive for years 2009 and 2010 but negative for 2011. This means that in years 2009 and 2010 the company decreased the size of the inventory, generating more cash. On the contrary, in year 2011 the company increased the size of the inventory impacting the cash flow by $-1.775 million.

In Figure 4, section *Operating Activities*, the **items income before extraordinary items** and **depreciation and amortization** are taken directly from the income statement (see Figure 2, same for items **Accounts Receivable** and **Inventory** taken from Figure 1). Other

items in this section such as **Accounts Payable and Accrued Liabilities**, **Sale of Property, Plant and Equipment and Investments**, and **Funds from Other Operations** might require additional information that was not specifically shown in the balance sheet (Figure 1) or the income statement (Figure 2).

Items in the section *Investing activities* (Figure 4) are not straight forward and require additional information. They are not taken directly from either the **balance sheet** or the **income statement**. This is similar to items in the section *Financing Activities* where reviewing the balance sheet (Figure 1) there is no additional information on the Stockholder's equity items.

## 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 varies 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 public trading company) is used to illustrate the concepts.

### 5.1 Liquidity Ratios

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 |

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. In the following, we will address some of the most important liquidity ratios to help analyze the short term paying capacity of any firm.

- Days' sales in receivables are calculated as:

*Days' Sales in Receivables = Gross Receivables/(Net Sales/365)*

The result of this ratio should be equal 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, then 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 collection 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 is 104.4. In both cases, similar to 2009.

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

*Accounts Receivable Turnover in Days = Average Gross Receivables/(Net Sales/365)*

This ratio should be as small as possible to indicate that the number of receivables compared to net sales is small.

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

*Days' Sales in Inventory = Ending Inventory/(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.

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

*Inventory Turnover=Cost of Goods Sold/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:

*Inventory Turnover in Days = Average Inventory/(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:

*Operating Cycle = Accounts Receivable Turnover in Days + 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:

*Working Capital = Current Assets – 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 good difference between current assets and current liabilities. The bigger the difference (working capital), the higher capacity the company would have to repay a loan. .

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

*Current Ratio = Current Assets/Current Liabilities*

In general, 2 has been considered a good current ratio. However, today many companies have current ratios under 2, 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. 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:

*Acid Test Ratio = (Current Assets-Inventory)/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 towards 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 here explained 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

| | Year | | |
|---|---|---|---|
| **Ratios** | **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:

*Debt Ratio = Total Liabilities/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 owns 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 is, the better the company's debt position is. It is calculated as:

*Debt/Equity Ratio = Total Liabilities/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:

*Debt to Tangible Net Worth Ratio = Total Liabilities /(Shareholders' Equity-Intangible Assets)*

As shown in **Error! Reference source not found.** 3, this particular ratio is the same as the debt/equity ratio because the company does not report any intangible assets (see Figure 1).

## 5.3 Profitability Ratios

Table 4. Profitability Ratios for Haverty Furniture

| | Year | | |
|---|---|---|---|
| **Ratios** | **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% | 30% | 30% |

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:

*Net Profit Margin = Net Income before Extraordinary Items/Net Sales*

From Table 4, we can see that in year 2009 this ratio was negative, 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 against interest rates offer 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, then the earnings per month are 2%/12= 0.17%. Any business that can generate more than 0.17% on a monthly basis in net profit margin 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:

*Total asset turnover = Net sales / Total 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 the case of 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. 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.

- Return on assets (ROA). 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:

*Return on Assets = Net Income before Extraordinary Items/Total Assets*

Return on assets 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 return on assets is very poor. On the contrary, another company could have a poor total asset turnover ratio but a very good return on assets ratio. Investors usually prefer the return on assets ratio because it shows how efficient are

businesses on using assets to generate profit, not just revenue. Ultimately, is profits what leads the way to increase earnings per share.

Using the 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 **Error! Reference source not found.**.

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

*ROI = (Net Income before Extraordinary Items + Interest Expense x (1-Tax Rate)) / (Long Term Liabilities + Equity)*

The ROI is a ratio used to evaluate the firm's performance regarding the firm's ability to reward those who provided long-term funds, and to attract providers of future capital. Managers and investors like to use this ratio 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 (ROE). The ROE measures the return to both common and preferred stockholders. This ratio is as follows:

Return on equity (ROE) = *Net Income before Extraordinary Items/Total Equity*

Return on equity measures financial performance by dividing net income by the shareholders' equity and it could thought 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 RTE 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 educational material.

## 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 (ERP) 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. Financial data available for a picture frame manufacturer (in US dollars).

| 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 years 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 for each year.

**Exercise 3**

Use the information and results of Exercise 2 to develop a balance sheet for years 2006 and 2007

**Exercise 4**

Use the information and results Exercise 2 and Exercise 3 and to develop a cash flow statement for years 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 their sales into cash
2. The company is not been able to pay their 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

Prepare the following items:

1. An income statement
2. A balance sheet statement
3. Financial ratios:
    a. Current ratio
    b. Quick ratio
    c. Inventory turnover
    d. Debt ratio
    e. Return on assets

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 | Purchasing of ERP System | $25,000 |

**Exercise 8**

Revise Figure 5. What is the net profit margin?

a. 40.8%

b. 5.89%

c. 8.45%

d. 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 **Error! Reference source not found.**, 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 |
| *Current Assets - Other - Total* | *12.592* | *9.274* | *11.242* |
| *Current Assets - Total* | *685.878* | *503.713* | *427.432* |
| 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 |
| *Current Liabilities - Total* | *227.502* | *176.761* | *141.069* |
| 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 |
| *Liabilities - Total* | *633.024* | *495.314* | *416.846* |
| **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 US hardwood lumber to India.

shows balance sheet of the project for the first five years. Answer the following questions:

1. In year one 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 one the equipment value is $552,000 and in year five the value of equipment is $320,000? Why did the value decrease? Explain clearly.

3. Calculate the Debt/Networth 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 both and explain the difference between these 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.