Chapter 17 – Financial Statements and Ratios

17.1: The Income Statement

17.1.1: Learn the terms used with income statements

**Income Statement:** a financial statement used to summarize all income and expenses for a company for a given time period (i.e. a month, a quarter, a year)

**Gross Sales (Gross Revenue):** the total amount of money received from customers

**Returns:** returns made by customers (not usually counted by large companies)

**Net Sales:** value of the goods/services bought and retained by customers

\[ \text{Net Sales} = \text{Gross Sales} – \text{Returns} \]

**Cost of Goods Sold:** amount paid by the company for the items sold to customers

**Gross Profits:** money left over after the company pays for the goods sold to customers

\[ \text{Gross Profit} = \text{Net Sales} – \text{Cost of Goods Sold} \]

**Overhead (Operating Costs):** the firm's cost to run the business

**Net Income Before Taxes:** amount earned before a company pays taxes

\[ \text{Net Income Before Taxes} = \text{Gross Profit} – \text{Operating Expenses} \]

**Net Income:** the amount a company has remaining after paying taxes

\[ \text{Net Income} = \text{Net Income Before Taxes} – \text{Income Taxes} \]

17.1.2: Using General Motor's income statement as an example

Consider the following income statement, with two items missing: Cost of Goods Sold and Income Taxes. Note that the numbers are rounded off to Millions of Dollars.

<table>
<thead>
<tr>
<th>Income Statement for General Motors – YE 12/31/2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross sales</td>
</tr>
<tr>
<td>Returns</td>
</tr>
<tr>
<td>Net sales</td>
</tr>
<tr>
<td>Cost of goods sold</td>
</tr>
<tr>
<td>Gross profit</td>
</tr>
<tr>
<td>Overhead</td>
</tr>
<tr>
<td>Net before taxes</td>
</tr>
<tr>
<td>Income taxes</td>
</tr>
<tr>
<td>Net Income</td>
</tr>
</tbody>
</table>
Notice that GM made almost $2 billion in profit! We can find these values for other public companies because they must publish their finances as publicly traded companies. If we want to find out financial statements about publicly traded companies, they can be found on the internet.

To check your figures from the income statement, you can use the following formula:
\[
\text{Returns} + \text{Cost of Goods Sold} + \text{Overhead} + \text{Taxes} + \text{Net Income} = \text{Gross Sales and other Income}
\]

17.1.3: Complete an income statement

For the next example, we must know the difference between initial inventory and ending inventory. Just as the names imply, initial inventory is the cash value of on-hand goods at the beginning of the period, ending inventory is the cash value of the inventory on hand at the end of the period. One useful formula that we have is

\[
\text{Initial Inventory} + \text{Cost of Goods Purchased} + \text{Freight} - \text{Ending Inventory} = \text{Cost of Goods Sold.}
\]

Example: During their first year of business, Lawn and Tractor, Inc. had gross sales of $159,000 and returns of $12,000. As of January 1 their inventory was $44,000. Throughout the year, $104,000 worth of inventory was added and sold, but freight costs did amount to $2,000. On the last day of the period being examined, December 31, inventory on hand had a cash value of $53,000. The company paid $19,000 in wages, $9600 for rent, $1400 for advertising, $2100 for utilities, and $3800 for taxes. Additionally, they had $5200 in miscellaneous expenses and paid $500 in income taxes. Complete an income statement for the year for Lawn and Tractor, Inc.
17.2: Analyzing the Income Statement
In the previous section we created an income statement that helps break down income and expenses for a given period for a company. Still, a company might ask a question such as “What happened to each part of the sales dollar?” To answer this question, we will need to list the important parts of the income statement as a percent of net sales. This procedure is called vertical analysis.

17.2.1: Compare income statements using vertical analysis
Recall the PBR formula, and its reworking to yield the rate:
\[ \text{Rate} = \frac{\text{Part}}{\text{Base}} \]

We will use the same formula for our vertical analysis in the following way:
\[ \text{Rate} = \frac{(\text{Particular Item})}{(\text{Net Sales})} \]

That is, we will always have net sales in the denominator. Looking back at our example for GM, we see that
\[ \% \text{ Cost of Goods Sold} = \frac{153,344}{186,763} = 82.1\% \]

We have now used vertical analysis to conclude that GM spent over 80% of its revenue on purchasing components for the goods that it sells.

Example: Below is the income statement for GM for the year following the one completed in Section 1. Perform vertical analysis on each area to obtain a perspective about GM’s financial progress.

<table>
<thead>
<tr>
<th>Income Statement for General Motors – YE 12/31/2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross sales</td>
</tr>
<tr>
<td>Returns</td>
</tr>
<tr>
<td>Net sales</td>
</tr>
<tr>
<td>Cost of goods sold</td>
</tr>
<tr>
<td>Gross profit</td>
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<td>Net before taxes</td>
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<tr>
<td>Income taxes</td>
</tr>
<tr>
<td>Net Income</td>
</tr>
</tbody>
</table>

Notice that even though Cost of Goods Sold increased from 2002 to 2003, GM was able to increase profit by reducing overhead.

17.2.2: Calculate percent of net sales
The formula that was given to check your figures for the income statement can be used the same for percents. Check this for the 2002 data from GM.
17.2.3: Compare an income statement with published charts

Another way to analyze an income statement is to compare its percent of net sales to a chart that details average percents for the industry. If we look at the table on page 664, and pretend that Burton's Shoes is instead Burton's Steaks (a restaurant), how is Burton's Steaks faring compared to the industry?

17.2.4: Prepare a horizontal analysis

Finally, we can compare one income statement to another by using horizontal analysis. In horizontal analysis we study the percent change from one period to another, rather than comparing the percent of net sales from one period to the next. For example, with our data from '02 and '03 for GM, we could see that the percent change in revenue is equal to 5.1%--that is,

\[
\frac{\text{New} - \text{Old}}{\text{Old}} \times 100
\]

To find percent changes we use the following formula:

\[
\frac{\text{New} - \text{Old}}{\text{Old}} \times 100.
\]

**Example:** Finish a horizontal analysis for GM from 02 to 03.
17.3: The Balance Sheet

17.3.1: Identify the terms used with balance sheets

Whereas an income sheet gives an account of the state of a firm over a period of time, the balance sheet gives a snapshot at one moment in time for a company. Like the income statement, there is a set of terminology that needs to be learned.

Assets

Current assets: cash or items that can be converted to cash within a short period of time (i.e. less than a year)
- Cash: cash in checking or savings accounts
- Marketable Securities: stocks, bonds, and other securities that can quickly be converted to cash
- Accounts Receivable: funds owed by customers
- Notes Receivable: notes (loans) owed to the company
- Inventory: cost of merchandise that the firm has for sale

Fixed Assets: assets that are expected to be used for more than one year
- Land: book value of any land owned by the firm
- Buildings: book value of any building(s) owned by the firm
- Equipment: book value of any equipment, fixtures, furniture, and similar items owned by the firm

Liabilities

Current Liabilities: items that must be paid by the firm within a short period of time (usually less than one year)
- Accounts Payable: amounts that must be paid to other firms
- Short-term Notes Payable: short-term notes (loans) that must be paid by the firm

Long-term Liabilities: items that will be paid, but after a year's time
- Mortgage's Payable: total due on all mortgages
- Long-term Notes Payable: total of all long term notes owed by the company

The difference between the total of all assets and the total of all liabilities is called the owner's equity—sometimes referred to as net worth. For a corporation, this would be called the stockholder's equity. From this we have the following formula

$$\text{Owners' Equity} = \text{Assets} - \text{Liabilities}$$

17.3.2: Prepare a balance sheet

Let us prepare a balance sheet for the fictitious company, The Farmers Market.

The Farmers Market has $8,000 currently listed as its cash reserve, $11,000 as its notes receivable, $15,000 in accounts receivable, and $51,000 in inventory. The land they own is worth $24,000, and they have buildings worth $22,000 as well as store fixtures that are worth $18,000. Liabilities include short-term notes payable worth $8,000, accounts payable valued at $26,000, mortgages that have a total of $39,000, and long-term notes payable with a total of $24,000. The owners' equity is currently $52,000.
17.4: Analyzing the Balance Sheet & Financial Ratios

17.4.1: Comparing balance sheets with vertical analysis

With the balance sheet, we express each item in terms of a percent of total assets when doing vertical analysis. When we make a comparative balance sheet, we perform vertical analysis on two different years and compare the percentages. Look at page 676, and notice the following: (1) percentages for assets and liabilities should always add up to 100% for each (give or take a small amount for rounding); (2) we can use various entries to conclude results—for instance the drop from 6.1% to 1.8% for stockholder’s equity.

Example: Look at problem 1 on 682.

17.4.2: Prepare a horizontal analysis

Just as we did in section 2, we can perform a horizontal analysis on two balance sheets. All we need is to use our formula

\[
\% \text{ Change} = \frac{(\text{New} - \text{Old})}{\text{Old}} \times 100.
\]

Looking at Example 2 on page 677, how does the value and percent change differ when we replace 2001's accounts receivable to $16,321?

17.4.3: Find the Current Ratio

The current ratio—also known as the banker’s ratio—is the ratio obtained by dividing current assets by current liabilities:

\[
\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}.
\]

Now, there are three general possibilities for the current ratio (CR): < 1, = 1, or > 1. Let's examine what each case represents.

CR < 1: If the CR is less than one, the firm currently has more liabilities than it does assets. One way of looking at this is that even if the firm liquidated everything it owned and paired the sales with its cash/investment assets, it could not cover its debts.

CR = 1: If the CR is exactly one then the company has as much worth as it owes out. This dangerous area can become good or bad quickly.

CR > 1: If the CR is greater than one, then the firm has more assets than it does liabilities. This is the ideal place for a firm to be as it implies current financial stability as well as the ability to handle sudden decreases in income (increases in debt) to a certain point.

Example: Find the Current Ratio for GM for 2001 and 2002 from the balance sheets given in example 1 on page 676.

One disadvantage of the Current Ratio is that the figure includes inventory that may not be able to be sold off at a reasonable price. For this reason, many accountants prefer the Acid-Test Ratio.
17.4.4:  **Find the Acid-Test Ratio**

The Acid-Test Ratio relies on liquid assets: assets that are cash or can be converted to cash quickly (such as securities, accounts/notes receivable). The Acid-Test Ratio (ATR) is given by the formula

\[
\text{Acid-Test Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}.
\]

Just as with the Current Ratio, we want the ATR to be greater than or equal to 1. If you find the ATR for GM for 2002, you will see a result of 0.59, which is certainly less than 1.

17.4.5:  **Find the ratio of net income after taxes to average owners' equity**

If we look in on a large company with a lot of capital invested, and also do the same for a small company with only a small capital investment, we should expect to see the large company having a higher net income. One way to check this is with the **Ratio of Net Income After Taxes to Average Owners' Equity (RNI2AOE)**. To find this ratio, we first need to find what the average owners' equity was throughout the year. To do this, we use the formula:

\[
\text{Average Owners' Equity (AOE)} = \frac{([\text{OE at beginning of year}] + [\text{OE at end of year}])}{2}.
\]

Notice that this is the same method for finding the average of 2 things—like test scores, bowling scores, ages, etc. After we have the AOE, we have that

\[
\text{RNI2AOE} = \frac{\text{Net Income After Taxes}}{\text{AOE}}.
\]

First, we remark that this is the first ratio that requires both the income statement and the balance sheet. Next, you might ask why we look at this ratio. The answer is not as immediate as the others so far, but if I tell you that the RNI2AOE is sometimes referred to as the Return on Equity, it should be more apparent. The RNI2AOE is a ratio that indicates what your expected yield on an investment in the company should be. If the RNI2AOE is less than the current interest rate paid on savings and government bonds, the capital should be placed in the bank instead of being invested in the company.

**Example:**  *What is the RNI2AOE for GM in 2002?*

17.4.6 & 17.4.7:  **Find the accounts receivable turnover & the average age of AR**

Another useful financial ratio is the **AR Turnover**. What this tells us is—on average—how many accounts receivable accounts are turned over (i.e. collected). First, we need to know what the average balance of the accounts receivable was for the year:

\[
\text{Average AR} = \frac{([\text{AR at beginning of year}] + [\text{AR at end of year}])}{2}.
\]

Once we know this dollar amount, we only need to divide it in to Net Sales to find the **AR Turnover**:

\[
\text{AR Turnover} = \frac{\text{Net Sales}}{\text{Avg. AR}}.
\]

This figure provides us with a snapshot of how many times per year the company is collecting what it is owed. If this number begins to grow, the company is getting better at collecting. If the number starts to diminish, the company could be headed for financial troubles.

Looking back at GM's balance sheet for 2002, we see that their **AR Turnover** was 11.9. This indicates they turned their AR over about 12 times in a year.

This number points to the **Average Age of AR**—how long monies owed remain uncollected on
average. To find the **Avg. Age of AR**, we use the following formula:

\[
\text{Avg. Age of AR} = \frac{365}{\text{(AR Turnover)}}
\]

For example, suppose GM’s **AR Turnover** for 2005 was 17.6, what would their **Avg. Age of AR** be?

### 17.4.8: Find the Debt-to-Equity Ratio

In general, companies must usually borrow money to make money. This practice is acceptable provided that they do not take on so much debt that they could no longer do business. One common metric that serves as an indicator for the health of a company is the **Debt-to-Equity Ratio (D2E)**:

\[
D2E = \frac{[(\text{Current Liabilities}) + (\text{Long term Liabilities})]}{\text{(Owners’ Equity)}}
\]

For instance, GM’s **D2E** in 2002 was 53.6...is this number good or bad? The answer is: it depends. What is depends on primarily is the industry and how fast inventory can be converted to cash. To get a better sense of whether GM’s 53.6 **D2E** is good or not, we look at other car manufacturers. In 2002, Ford’s **D2E** was 49.7, Toyota’s was 1.8, and DaimlerChrysler’s was 4.4. Clearly GM is the worst of the 4 and this is another indicator that they were headed for the financial hardship that befell them at the start of the recession.