Chapter 2: Financial Statement Analysis

Firms' disclosure of financial information

Financial statements are accounting reports issued by a firm periodically that present past performance information and a snapshot of the firm's financial position. Public companies must file their financial statements to a list of relevant authorities. The *annual report* is the yearly summary of business sent by publicly listed companies to their shareholders that accompanies or includes the financial statement. Private companies also prepare financial statements, but they don't have to disclosure these reports to the public. The information in a financial statement is useful for investors, financial analysts, managers and other interested parties (e.g. creditors).

There are guidelines regarding the preparation of a financial statement. The g*eneral accepted accounting principles* (GAAP) is a common set of rules and a standard format for public companies to use when they prepare their financial reports, e.g. US GAAP and IFRS. Because assurance about the accuracy is important for investors, a corporation has to hire a neutral third party: an auditor. An *auditor* checks the annual financial statements, ensures they are prepared according to GAAP and provides evidence to support the reliability of the information.

We will describe the three main types of financial statements: the balance sheet, the income statement and the statement of cash flows.

Balance sheet

The balance sheet is a list of the assets and liabilities of a firm. This list provides a snapshot of the financial position at a given point in time. A balance sheet is divided into two parts:

Balance	sheet
Assets	Stockholders' equity Liabilities

- (left) The *assets*: the cash, inventory, property, plant and equipment, and other investments a company has made. Shows how the firm uses its capital.
- (right) The *liabilities*: the obligations of a firm to its creditors.
- (right) The *shareholders' equity:* an accounting measure of a firm's net worth that represents the difference between the firm's assets and its liabilities.

The right side summarizes the sources of capital.

The balance sheet identity: Assets = Liabilities + Shareholders' equity

Assets

The assets of a firm are divided into current assets and long-term assets.
Current assets consist of cash or assets that could be converted into cash within one year:

1. Cash and other marketable securities. *Marketable securities* are short-term, low-risk investments that can be easily sold and converted to cash.
2. *Accounts receivable*: amounts owed to a firm by customers who have purchased goods or services on credit.
3. *Inventories:* a firm's raw materials as well as its work-in-progress and finished goods.
4. Other current assets, e.g. prepaid expenses.

Long-term assets are assets that produce tangible benefits for more than one year. *Depreciation* is the yearly deduction a firm makes from the value of its fixed assets over time, according to a depreciation schedule that depends on an asset's life span. Depreciation isn't an actual cash expense. The *book value* is the valuation of an asset on the balance sheet: the acquisition cost of an asset less its accumulated depreciation.

Liabilities

Like assets, liabilities are also divided into current liabilities and long-term liabilities.
The *current liabilities* are the liabilities that will be satisfied within one year.

1. *Accounts payable*: the amounts owed to creditors for products or services purchased with credit.
2. *Notes payable* or *short-term debt:* loans that must be repaid in the next year.
3. Accrual items that are owed but have not yet been paid.

The *net working capital* is the difference between a firm's current assets and current liabilities that represent the capital available in the short term to run the business. So,

Net working capital = Current assets – Current liabilities.

The *long-term liabilities* are defined as any loan or debt obligation with a maturity of more than a year.

Stockholders' equity

As mentioned, the difference between the assets and the liabilities is the stockholders' equity. The stockholders' equity is also called the *book value of equity*, it represent the net worth of a firm from an accounting perspective. However, the book value of equity isn't an accurate assessment of the actual value of the firm's equity. The book value of equity differs from the market value of the firm's equity, because of the way assets and liabilities are recorded for accounting purposes. The total market value of a firm's equity equals the market price per share times the number of shares (*market capitalization*).

Balance sheet analysis

The *book value of equity* is sometimes used as an estimate of the liquidation value; the value of a firm after its assets are sold and the liabilities are paid.

For comparing the market and book values of equity, we use the *market-to-book (or price-to-book) ratio*: the ratio of a firm's market capitalization to the book value of its stockholders' equity.

Market-to-book ratio = Market value of equity / Book value of equity.

The market-to-book ratio of a successful firm typically exceeds 1.
This ratio provides feedback to its managers on the market's assessment of their decisions. *Value stocks* are firms with low market-to-book ratios. *Growth stocks* are firms with high market-to-book ratios.

From the balance sheet, we can also get information about the leverage of a firm. *Leverage* is a measure of the extent to which a firm relies on debt as source of financing. The ratio of a firm's total amount of short- and long-term debt to the value of its equity is called the *debt-equity ratio. Debt-equity ratio* = total debt / total equity.

We can calculate this ratio using either book or market values for equity and debt.

The *enterprise value* is the total market value of a firm's equity and debt, less the value of its cash and marketable securities. The enterprise value measures the value of the firm's underlying business assets, unencumbered by debt and separate from any cash and marketable securities. *Enterprise value* = Market value of equity + Debt – Cash.

To measure whether the firm has sufficient working capital to meet its short-term needs, creditors compare the current assets and the current liabilities. The current ratio is the ratio of current assets to current liabilities. *Current ratio* = current assets / current liabilities.

The quick ratio is the ratio of current assets other than inventory to current liabilities.

Quick ratio = (current assets – inventory) / current liabilities.
A low ratio means high risk.

Income statement

The *income statement* reports a list of the revenues and expenses of the firm over a period of time. This statement computes the firm's bottom line of net income/earnings, this is a measure of the profitability during a period.

Income statement:
Net sales
- Cost sales
Gross profit
- (operating) expenses
- R&D
- Depreciation & amortization
+ Other income
Operating Income
+ Share of results of associated companies
EBIT
+ Interest income (expenses)
Pretax Income
- Taxes
Net Income

An income statement consists of different categories:

- *Gross profit*: the difference between a firm's sales revenues and its costs.
- *Operating income:* the gross profit of a firm less its operating expenses. Operating expenses are expenses form the ordinary course of running the business. These expenses aren't directly related to producing the goods or services being sold.
- *Earnings before interest and taxes (EBIT)*: the firm's earnings before interest and taxes are deducted.
- Pretax and Net income. Net income represents the total earnings of the firm's equity holders. It is often reported on a per-share basis as the firm's earnings per share. You compute the *earnings per share (EPS)* dividing the net income by the total number of shares outstanding.
  EPS = net income / shares outstanding.

There are two ways to issue more shares:

1. To give stock options to employees or executives. *Share (stock) options* give the holder the right to buy a certain number of shares of stock by a specific date at a specific price.
2. To issue convertible bonds. *Convertible bonds* are corporate bonds with a provision that gives the bondholder an option to convert each bond owned into a fixed number of shares.

In the case of share options and convertible bonds the increase in the total number of shares, because there will be more shares to divide into the same earnings, is called *dilution.* The *diluted EPS* shows the EPS the company would have if the stock options were exercised.

Income statement analysis

The income statement provides useful information about the profitability of the firm and how it relates to the value of the firm's shares. Some profitability ratios that are often used to evaluate a firm's performance and value:

- *Gross margin,* this is the ratio of gross profit to revenues (sales). It reflects the ability of the company to sell a product for more than the sum of the direct costs of making it.
  Gross margin = Gross profit / sales.
- *Operating margin*, this is the ratio of operating profit to revenues. This ratio indicates how much a company earns from each dollar of sales, before interest and taxes are deducted.
  Operating margin = Operating Profit / Sales
- *Net profit margin,* this is the ratio of net income to revenues. The net profit margin shows which part of each dollar in revenues is available to equity holders, after the firm pays its expenses plus interest and taxes.
  Net profit margin = Net income / Sales

Asset efficiency

By combining the information from the balance sheet and the income statement, you can measure how efficiently a firm is utilizing its assets.

The ratio of sales to total assets is called the *asset turnover,* a broad measure of efficiency.

Asset turnover = Sales / Total assets.

When the asset turnover is low, you can conclude that the firm in not generating much revenues per euro of assets.

Another efficiency ratio is the *fixed asset turnover.* The fixed asset turnover is the ratio of sales to fixed (non current) assets.

Fixed asset turnover = Sales / Fixed assets.

Working capital ratios

Besides the information about the assets, information about the net working capital is very important for financial managers.

Accounts receivable days: an expression of a firm's accounts receivable in terms of the number of day's worth of sales that the accounts receivable represents. Also called: average collection period or days sales outstanding.

Accounts receivable days = Accounts receivable / Average daily sales.

Accounts payable = accounts payable / average daily cost of goods sold
Inventory days = inventory / average daily cost of goods sold.

There is also a ratio to measure how efficiently a firm turns his inventory into sales: the inventory turnover ratio. In general, a higher level of inventory turnover is better.

Inventory turnover = Sales / inventory.

EBITDA is a computation of a firm's earnings before interest, taxes, depreciation and amortization are deducted. The EBITDA reflects the cash a firm has earned from its operations.

Lenders often asses a firm's leverage by computing an interest coverage ratio or times interest earned (TIE) ratio.

TIE = operating income (earnings) / interest expense

A high outcome shows that the firm is earning more than necessary to pay the interest. Financial managers watch these ratios carefully because they asses how easily the firm will be able to cover its interest payments.

Analysts and financial managers often evaluate the firm's return on investment by comparing its income to it investment using ratios such as ROE and ROA;

Return on equity (ROE) = Net income / Book value of equity
Return on assets (ROA) = Net income / Total book value of assets.

The *DuPont identity* expresses return on equity as the product of profit margin, asset turnover and a measure of leverage. This identity is a way to delve deeper into the sources of return on equity. By doing this, a financial manager can gain a clear sense of the financial picture of the firm.

The final expression of the DuPont identity states that the ROE is equal to the net firm's profit times asset turnover times the equity multiplier. The *equity multiplier* is a measure of leverage equal to the total assets divided by total equity.

Valuation ratios

The price-earnings ratio (P/E) is the ratio of the market value of equity to the firm's earnings, or its price to its earnings per share. The valuation ratios give information about the market value of the firm.
P/E ratio = Market capitalization / Net income
or
P/E ratio = Share Price / Earnings per share

When the firm's earnings per share are negative it is not meaningful to look at the P/E ratio. In this case it is common to look at the firm's enterprise value relative to sales.

The *PEG ratio* is the ratio of a firm's P/E to its expected earnings growth rate. Investors consider PEG ratios of 1 or below as indicating that the stock is fairly priced. When the PEG ratio is higher than 1, investors question whether the company is overvalued.

Statement of cash flows

The income statement provides information about profits but this statement doesn't give any information about the amount of cash the firm has earned. The statement of cash flows does. The *statement of cash flows* is an accounting statement that shows how a firm had used the cash it earned during a set period. A cash flow statement is divided into three sections: operating activities, investment activities and financing activities.

Cash Flow Statement:

Operating activities
Net income
+ Depreciation and amortization
+/- Changes in net working capital (acc. receivable(+), acc. payable(-) and inventory(+))
Cash from operating activities

Investment activities
- Capital expenditures
+ Acquisitions and other investing activity
Cash from investing activities

Financing activities
- Dividends paid
- Sale or purchase of shares
+/- Increase/decrease in short-term borrowing
+/- Increase/decrease in long-term borrowing
Cash from financing activities
- Foreign exchange adjustment
Change in cash and cash equivalents

- The operating activities start with net income, to this number they add back all non-cash entries related to the firm's operating activities (this means: deducting the depreciation, deducting an increase in accounts receivable, adding an increase in accounts payable and deducting an increase in inventory).
- The investing activities list the cash used for investment. Purchases of new property, plant and equipment are *capital expenditures.*
- The financing activities reflect the flow of cash between investors and the firm. The *retained earnings* of a firm is the difference between net income and the amount a firm spends on dividends.

Retained earnings = Net income – Dividends

The *payout ratio* is the ratio of a firm's dividends to its net income.

Payout ratio = dividends / net income.

Other financial statement information

We have discussed the most important elements of a firm's financial statements (balance sheet, income statement and statement of cash flows). Now we will discuss several other pieces of information contained in the financial statements: the management discussion and analysis, the statement of changes in shareholders' equity and notes to the financial statement.

1. Management discussion and analysis
The *management discussion and analysis* (MD&A) is a preface to the financial statements in which a company's management discusses the recent year (or quarter), providing a background on the company and any significant events that may have occurred. Management may also discuss the coming year and outline goals and new projects.

Management is also required to disclose any *off-balance sheet transactions*: transactions or arrangements that can have a material impact on a firm's future performance yet do not appear on the balance sheet.

2. Statement of changes in shareholders' equity
The *statement of stockholders' equity* is an accounting statement that provides details of changes in share capital and reserves. It breaks down the stockholders' equity computed on the balance sheet into the amount that came from issuing new shares versus retained earnings. It is not always useful to financial managers because of the use of book values rather than market value.

3. Notes to the financial statement
This notes generally contain important details regarding the numbers used in the main statements. They also often provide information specific to a firm's subsidiaries or its separate product lines.

Financial reporting in practice

Financial statements have proved to be important, because of recent accounting scandals. The penalties for fraud have increased and new legislation had tightened the procedures firms must use to assure that statements are accurate.

In 2002 the U.S. congress passed the *Sarbanes-Oxley act (SOX)*, which was intended to improve the accuracy of financial information given to both boards and shareholders.