ANALYSIS OF FINANCIAL STATEMENTS (CHAPTER 2)

- Financial Statements and Reports—financial reporting is used to disclose information about the firm to investors, creditors, governments, and other interested parties; information about the firm is used to determine what has been accomplished in the past and forecast what is likely to be accomplished in the future; a corporation constructs an *annual report* that includes (1) a general discussion about the firm's activities during the past year as well as developments that are expected to be implemented in the near future (i.e., next year) and (2) the financial statements of the firm for the most recent years (the year just ended and up to four or five previous years); the annual report generally includes the following financial statements:

    - Balance Sheet—records the financial position of the firm *at* a particular point in time by showing the assets (*investments*) and the liabilities and equity (*financing*) of the firm; some points about the balance sheet include:
        - Cash versus other assets—on the assets side of the balance sheet, only cash represents actual funds that can be invested; the other assets represent investments made in the past that are expected generate (or help generate) funds in the future (some sooner than others—that is, current assets); the values reported on the balance sheet do not necessarily represent the values of the assets outside the firm (that is, in the marketplace) because the "book" values of assets are based on the original purchase prices of the assets rather than their current market values.
        - Liabilities versus stockholders' equity—the liabilities of a firm represent the debt, or money, the firm owes to lenders, while equity represents the ownership position of the stockholders; the *net worth* of the firm is defined as the value of the total assets minus the value of the total liabilities, which is the amount that would be left to distribute to stockholders if the firm's assets could be sold at book value and the firm's debt (liabilities) could be paid off at book value.
        - Preferred versus common stock—all corporations have one type of stock called common stock; some firms have equity called preferred stock that has preference with respect to dividend payments and other cash distributions made by the firm (that is, preferred stockholders are paid before common stockholders); the per share dividend paid to preferred stockholders generally is a fixed amount; preferred stockholders do not have voting rights (to elect members of the board of directors), while common stockholders do.
        - Common equity account—the common equity section of the balance sheet generally is divided into three accounts: (1) common stock, which equals the number of shares outstanding times the par value of each share; (2) paid-in capital, which represents the amount above the par value for which common stock was issued; and (3) retained earnings, which represents income the firm earned in the past that was "retained" and reinvested in the firm (i.e., earnings not paid to stockholders as dividends); retained earnings is an amount that has been accumulated since the firm started operating; the amount in retained earnings usually is not the same as the amount in the cash account because the funds represented by retained earnings have been reinvested in other assets, such as inventory and equipment, during the life of the firm.

- Accounting alternatives—in many instances, the same business activity can be recorded using one of several accepted accounting methods—for example, inventory valuation can be based on either the FIFO (first-in, first-out) method or the LIFO (last-in, first-out) method; two identical firms could have significantly different numbers on their financial statements if different accounting methods are used.
- Time dimension—the balance sheet is a "snapshot" of where the firm is at a *specific point in time*, while the income statement (the statement of cash flows also) shows the results of the firm's activities *over a period of time*.

- Income Statement—provides a summary of the revenues recognized and the expenses incurred during a particular operating period; the revenues and expenses are not necessarily indicative of the cash inflows and cash outflows; records activity *over* a particular period; prepared at least once per year and usually on a quarterly basis.
  - Does net income determine value? No, value is determined by cash flows; if a firm sells all of its products for cash and pays all of its bills using cash, its net cash flow is computed as:

    Net cash flow = Net income + Depreciation and amortization

- Statement of Cash Flows—reports the effect of the firm's activities—operating, investing, and financing—on its cash position over some period
  - Income versus cash flows—the revenues and expenses that appear on the income statement are recognized when incurred, not when cash is affected—for example, revenues are recognized when sales are made rather than when the cash payments associated with sales are received, which means that when a firm sells on credit the revenues are reported for income purposes before payments for the sales are received
    - Non-cash items—some non-cash items appear on the income statement, such as depreciation; depreciation represents the reduction in value that is associated with the use of an asset that was purchased (paid for) at some earlier time, perhaps 15 years ago.
    - Accounting profit—net income, or the "bottom line" on the income statement; even though net income generally is not the same as the net cash flows generated by the firm over a particular period, there generally is a significant correlation between the two.
    - Operating cash flows—cash flows generated from the normal operating activities of the firm—that is, the manufacture and sale of inventory.
  - Cash flow cycle—general operating activities affect various balance sheet accounts and cash flows; for example, selling a product on credit immediately decreases inventory, immediately increases accounts receivable, generates a profit that is recognized in retained earnings (assuming the product is sold for more than it cost to manufacture), and, when the customer pays for the product at some future date, decreases receivables and increases cash.
  - Constructing a statement of cash flows—when constructing a statement of cash flows, apply the following simple rules:

Sources of Cash:	*Uses of Cash:*
↓ ***Asset Account*** Selling inventory or collecting receivables provides cash.	↑ ***Asset Account*** Buying inventory or other assets uses cash.
↑ ***Liability or Equity Account*** Borrowing funds or selling stock provides the firm with cash.	↓ ***Liability or Equity Account*** Paying off a loan, buying back stock, or paying dividends uses cash.

- Statement of Retained Earnings—shows the change in the retained earnings account since the last balance sheet was constructed.

- How Do Investors Use Financial Statements?—investors use financial statements to collect information that is useful when making financial decisions; some information that is contained in financial statements includes:
  - Working (Operating) Capital—short-term assets that are necessary to keep the firm "working;" spontaneous assets, which represent assets that arise as a result of normal business operations; generally spontaneous assets are financed with spontaneous liabilities, which represent debt (generally short-term) that arises as a result of normal business operations.

    Net working capital (NWC) = Current assets – Current liabilities

    When NWC is positive, then some of the firm's current assets are financed using long-term liabilities.

    $$\begin{matrix}\text{Net operating} \\ \text{working capital (NOWC)}\end{matrix} = \begin{pmatrix}\text{Current assets} \\ \text{required for operations}\end{pmatrix} - \begin{pmatrix}\text{Non-interest bearing} \\ \text{current liabilities}\end{pmatrix}$$

  - Operating Cash Flows—cash generated from the normal operations of the firm:

    Operating cash flow (OCF) = NOI(1 – Tax rate) + Depreciation and amortization expense

  - Free Cash Flow (FCF)—cash flow that the firm is free to pay out to investors

    FCF = OCF - Investments

  - Economic Value Added (EVA)—the amount by which the firm's value changes after compensating investors for the funds they provide the firm

    EVA = NOI(1- Tax rate) – [(Invested capital) x (After-tax cost of funds as a percent)]

    EVA is an estimate of the economic (true) profit that the firm generates.

- Financial Statement (Ratio) Analysis—provides a method to evaluate how financial positions (1) change on a year-to-year basis for a single firm and (2) compare between two firms, even if they differ in size; such analyses are useful to managers inside the firm and investors and creditors outside the firm who want to try to *predict future financial positions of firms*.

  - Liquidity ratios—give an indication of how well the firm can meet its current obligations; help measure the liquidity position (ability to convert assets into cash quickly without significant loss of principal) of the firm; too little or too much liquidity could be considered a "bad sign"—too little liquidity could suggest that the firm will have problems paying its current obligations in the future, whereas too much liquidity might suggest the firm is not investing its funds wisely (that is, the firm is earning a lower return than it should):
    - Current ratio—shows the relationship between current assets and current liabilities; a higher value for the current ratio suggests greater liquidity, and vice versa:

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

    - Quick, or Acid-Test, Ratio—similar to the current ratio, except the value of inventories is subtracted from current assets in the numerator; inventories represent the least liquid of the current assets:

$$\text{Quick, or acid-test, ratio} = \frac{\text{Current assets - Inventories}}{\text{Current liabilities}}$$

  - Asset Management Ratios—give an indication of how well (effectively) the firm manages its assets; show how often the firm is "turning over" its assets to generate funds; generally, when assets are not turned over quickly enough, it is because sales have slowed or current assets, such as inventory and receivables, are too high; if assets are turned over too quickly, it could mean that the firm is not producing enough, and vice versa:
    - Inventory turnover—shows how many times during a period (e.g., a year) the average inventory is turned over as the result of sales activities:

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventories}}$$

    - Days sales outstanding—indicates the average time, in days, it takes customers to pay for credit purchases—that is, the length of time it takes the firm to collect for credit sales; if the value is much greater than the credit terms offered by the firm, then many customers are paying extremely late (they are delinquent accounts):

$$\begin{matrix}\text{Days sales} \\ \text{outstanding}\end{matrix} = \text{DSO} = \frac{\text{Receivables}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\left[\frac{\text{Annual sales}}{360}\right]}$$

    - Fixed assets turnover—gives an indication of how efficiently the firm uses its fixed assets (excludes current assets) to produce revenues; measures how many dollars of sales are

generated for each dollar invested in fixed assets; generally, a higher value indicates a more efficient use of fixed assets than a lower value does:

$$\text{Fixed assets turnover ratio} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

- Total assets turnover—similar to the fixed assets turnover, except the value of total assets (includes current assets) is used in the denominator:

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total assets}}$$

- Debt management ratios—indicate how the amount of debt the firm has affects its financial position; financial leverage refers to the use of debt (primarily long-term debt); leverage helps to magnify returns, on both the positive and the negative sides, because debt represents a contractual obligation for which the same amount is repaid no matter how successful (or unsuccessful) the firm is:
  - Debt ratio—provides an indication of the capital structure of the firm; measures the percent debt used by the firm for the purposes of financing assets; generally, the higher the debt ratio, the greater the chance of bankruptcy; if the debt ratio is too low, however, it might suggest the firm is not using leverage wisely (leverage will be covered in greater detail in subsequent notes):

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}} = \frac{\text{Total liabilities}}{\text{Total liabilities + Owners equity}}$$

  - Times-interest-earned (TIE) ratio—indicates whether the firm generates sufficient operating income (not cash) to meet its interest obligations each year; a higher value suggests the firm is better able to pay interest on its loans:

$$\text{Times-interest-earned ratio} = \frac{\text{EBIT}}{\text{Interest charges}} = \frac{\text{Operating income}}{\text{Interest charges}}$$

    EBIT = Earnings before interest and taxes.
  - Fixed charge coverage ratio—like the times-interest-earned ratio, except all fixed payments related to financing are included; generally, in addition to interest, the firm must consider the amounts of the principal repayments on its outstanding debt as well as payments made for lease financing arrangements:

$$\text{Fixed charge coverage ratio} = \frac{\text{EBIT} + (\text{Lease payments})}{\left(\begin{matrix}\text{Interest}\\ \text{charges}\end{matrix}\right) + \left(\begin{matrix}\text{Lease}\\ \text{payments}\end{matrix}\right) + \left(\dfrac{\text{Sinking fund payments}}{1 - \text{Tax rate}}\right)}$$

$$= \frac{\text{Funds available to cover financing obligations}}{\text{Fixed financing obligations}}$$

- Profitability ratios—show how the firm's management of its liquidity position, assets, and debt has affected normal operating activities, and vice versa:
  - Net profit margin—shows what percent of sales revenues is left over after expenses related to operations and financing and taxes are paid; a low value might indicate that the firm's expenses are too high:

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

  - Return on total assets (ROA)—a measure of the return on investment earned by the firm; assets provide the means by which a firm produces and sells inventory, and thus generates cash flows; ROA represents a return on all invested funds (both debt and equity):

$$\text{Return on total assets (ROA)} = \frac{\text{Net income}}{\text{Total assets}}$$

  - Return on common equity (ROE)—similar to ROA, ROE is a measure of the return on the original funds invested by stockholders:

$$\text{Return on common equity (ROE)} = \frac{\text{Income available to common stockholders}}{\text{Common equity}}$$

    Income available to common stockholders = (Net income) – (Preferred dividends). Because most firms do not have preferred stock, generally the amount of income available to common stockholders is the same as net income.
- Market Value ratios—measures that consider the value of the firm's stock in the financial markets—that is, how well investors perceive the firm is creating value:
  - Price/earnings (P/E) ratio—gives an indication of how much investors pay for each dollar of income generated by the firm; high growth firms generally have higher P/E ratios, while riskier firms often have lower P/E ratios:

$$\text{Earnings Per Share (EPS)} = \frac{\text{Income available to common stockholders}}{\text{Number of common shares outstanding}}$$

$$\text{Price/ earnings ratio} = \frac{\text{Market price per share}}{\text{EPS}}$$

- Market/book ratio—indicates the relationship between the per-share selling price (market value) of the common stock and its book value per share; generally new firms and firms experiencing financial difficulty have lower market/book ratios:

$$\text{Market/book value} = \frac{\text{Market value per share}}{\text{Book value per share}} = \frac{\text{Market value per share}}{\left(\frac{\text{Common equity}}{\text{Number of common shares outstanding}}\right)}$$

  - Trend and comparative analysis—ratios should be evaluated (1) at a particular point in time in comparison to some norm, such as an industry average, to determine the current financial position of the firm (comparative analysis) and (2) over time to determine whether the current financial position is improving or deteriorating (trend analysis); such analyses help interested parties forecast the future financial position of the firm.

- Summary of Ratio Analysis—The DuPont Analysis—shows the relationship between the return on investment and both the total assets turnover and the net profit margin; can be used to determine in more detail where weaknesses or strengths exist; if ROA is relatively low, it might be due to a low profit margin, a slow turnover of assets, or both:

$$\begin{aligned}
\text{ROA} &= \text{Net profit margin} \times \text{Total assets turnover} \\
&= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}
\end{aligned}$$

$$\begin{aligned}
\text{ROE} &= \text{ROA} \times \text{Equity multiplier} \\
&= \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}} \\
&= \left[\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}\right] \times \frac{\text{Total assets}}{\text{Common equity}}
\end{aligned}$$

- Uses and Limitations of Ratio Analysis—financial statement analysis provides useful information about a firm's financial position, but there are caveats/limitations that must be considered when interpreting the information:
  - Classifying a very large firm into a single industry often is difficult because many of the firm's divisions are involved with different types of products.
  - Using a single norm, or "target," ratio for comparisons might be misleading because many firms strive for above-normal performances.
  - Because the values on balance sheets are historical costs, the computed values of the ratios might not portray a "true" picture—for example, during high inflationary times, inventory values and the costs of goods sold would be greatly affected.
  - Many firms experience seasonality, which means the values of ratios might be significantly different depending on what time of the year they are computed; be sure to compare a firm's ratios during similar operating periods with respect to seasonality; averages can also be used.
  - Sometimes firms use "window dressing" techniques to make their financial statements look

better than they actually are; this is temporary, and probably cannot be continued for extended periods, which emphasizes the need for trend analysis.
  - If firms use different accounting methods, comparisons between firms can be difficult.
  - Do not make general conclusions about the firm's financial position by examining only one or a few ratios; ratio analysis should be comprehensive.
  - The most important part of ratio analysis is the *judgment* used when interpreting the results, not the computation of the ratios.

- Chapter 2 Summary Questions—You should answer these questions as a summary for the chapter and to help you study for the exam.
  - What information is provided by each financial statement contained in a firm's annual report?
  - Why do firms conduct financial statement analyses?
  - What information does each of the five categories of ratios mentioned in the text provide to those who interpret the ratios?
    Liquidity ratios
    Asset management ratios
    Leverage ratios
    Profitability ratios
    Market value ratios
  - Who uses ratios?
  - Why is the statement of cash flows considered an important financial statement?
    - What would be a source of cash?
    - What would be a use of cash?
  - What are the limitations associated with ratio analysis?
  - Why is the interpretation of the ratios considered more important than the computation of the ratios?