Chapter 10

Stock Valuation

Outline

- Learning Objectives
- Principles Used in This Chapter
  1. Common Stock
  2. The Comparables Approach to Valuing Common Stock
  3. Preferred Stock
  4. The Stock Market

Learning Objectives

1. Identify the basic characteristics and features of common stock and use the discounted cash flow model to value common shares.
2. Use the price to earnings (P/E) ratio to value common stock.
3. Identify the basic characteristics and features of preferred stock and value preferred shares.
4. Use the secondary market for common stock.
Principles Used in This Chapter

- Principle 1: Money Has a Time Value.
- Principle 2: There is a Risk–Reward Tradeoff.
- Principle 3: Cash Flows are the Source of Value.
- Principle 4: Market Prices Reflect Information.

10.1 Common Stock

Common Stock

- Common stockholders are the owners of the firm.
- They elect the firm’s board of directors who in turn appoint the firm’s top management team.
Common Stock Characteristics

› Claim on Income

- Common stockholders have the right to the firm’s income that remains after bondholders and preferred stockholders have been paid.
- The common stockholders either receive cash payments in the form of dividends or the firm’s management reinvests the earnings in the firm.

› Claim on Income

- The right to residual income means that the potential return is unlimited;
- However, it could also mean that there maybe little or nothing left after claims of bondholders and preferred shareholders are met.

› Claim on Assets

- In case of liquidation, common stockholders have residual claim on assets.
- However, bankrupt firms rarely have enough assets to satisfy the claims of stockholders.
Common Stock Characteristics

- Voting Rights
  - In general, common shareholders are the only security holders given the right to vote.
  - Common shareholders have the right to elect the board of directors and approve any changes in the corporate charter.
  - Some firms have multiple classes of stock with different voting rights.

- Voting Rights (cont.)
  - For Example: Google’s class A stock has one vote per share and class B stock has 10 votes per share.
  - Class B stocks are owned by Chief Executive Eric Schmidt and founders Larry Page and Sergey Brin.

- Voting Rights (cont.)
  - Most shareholders vote by proxy.
  - A proxy gives a designated party the temporary power of attorney to vote for the signee at the corporation’s annual meeting.
  - There are two commonly used procedures for voting: majority voting and cumulative voting.
Common Stock Characteristics

- Voting Rights
  - Majority Voting: Each share of stock allows the shareholder one vote, and each position on the board is voted on separately. Because each member of the board is elected by a simple majority, a majority of shares has the power to elect the entire board of directors.

Common Stock Characteristics

- Voting Rights
  - Cumulative Voting: Each share of stock allows the shareholders a number of votes equal to the number of directors being elected. The shareholders can use all his or her votes for a single candidate or split them among the various candidates. The advantage of cumulative voting is that it gives minority shareholders the power to elect a director.

Common Stock Characteristics

- Agency Costs and Common Stock
  - In theory, common stockholders elect the board and effectively control the firm through their representatives on the board.
Common Stock Characteristics

- Agency Costs and Common Stock
  - In reality, stockholders are given a slate of nominees for the board selected by the management. As a result, management effectively elects the board and thus the board may have more allegiance to the managers than to the shareholders. This may lead to agency problems.

- Agency Costs and Common Stock
  - Managers are employees of the firm but may put their interests ahead of the firm's stockholders (its owners).
  - The costs associated with manager–stockholder agency problems are difficult to quantify, but it could be significant.

Valuing Common Stock Using the Discounted Dividend Model

- Like bonds, common stock's value is equal to the present value of all future cash flows that the stockholder expects to receive from owning the shares of stock.
- However, unlike bonds, the future cash flows in the form of dividends are not fixed. Thus the value of common stock is derived from discounting "expected dividend".
Three Step Procedure for Valuing Common Stock

Step 1:
- Estimate the amount and timing of future cash flows the common stock is expected to provide.

Step 2:
- Evaluate the riskiness of the future dividends, and determine the rate of return an investor might expect to receive from a comparable risk investment, which becomes the investor’s required rate of return.

Step 3:
- Calculate the present value of the expected dividends by discounting them back to the present at the investor’s required rate of return.
- The three steps show that the value of a common stock is equal to the present value of all future dividends.
Example 10.1 Consider a situation in which we are valuing a share of common stock that we plan to hold for only one year. What will be the value of the stock today if it pays a dividend of $2.00, is expected to have a price of $75 and the investor’s required rate of return is 12%?

\[
\text{Value of Common stock} = \text{Present Value of future cash flows} = \text{Present Value of (dividend + expected price)} = \frac{($2 + $75)}{(1.12)^1} = $68.75
\]

Example 10.2 Continue example 10.1. What will be the value of common stock if you hold the stock for two years and sell it for $82?
Value of Common stock
= Present Value of future cash flows
= Present Value of (dividends + expected price)
= \{($2) ÷ (1.12)^1\} + \{($2+$82) ÷ (1.12)^2\}
= $68.75

Valuing common stocks using general discounted cash flow model is made difficult as analyst has to forecast each of the future dividends.
This problem is greatly simplified if we assume that dividends grow at a fixed or constant rate.
- Recall the PV of a growing perpetuity

If the firm’s cash dividend grow by a constant rate each year, then the common stock can be valued as follows:
The Constant Dividend Growth Rate Model

\[ V_{cs} = \frac{D_1 (1 + g)}{r_{cs} - g} \]

- \( V_{cs} \) = Value of a share of common stock
- \( D_1 \) = Annual cash dividend in the year of valuation
- \( g \) = Annual growth rate in the dividend
- \( D_0 \) = Expected dividend for the end of year 1
- \( r_{cs} \) = The common stockholder’s required rate of return

Checkpoint 10.1

Valuing Common Stock

Consider the valuation of a share of common stock that paid a $2 dividend at the end of last year and is expected to pay a cash dividend every year from now to infinity. Each year, the dividends are expected to grow at a rate of 10%. Based on an assessment of the riskiness of the common stock, the investor’s required rate of return is 15%. What is the value of this common stock?
What is the value of a share of common stock that paid $6 dividend at the end of last year and is expected to pay a cash dividend every year from now to infinity, with that dividend growing at a rate of 5 percent per year, if the investor’s required rate of return is 12% on that stock?

With a perpetuity, a timeline goes on for ever with the growing cash flow occurring every period.

Step 1: Picture the Problem

1. With a perpetuity, a timeline goes on forever with the growing cash flow occurring every period.

<table>
<thead>
<tr>
<th>Years</th>
<th>Cash flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$6</td>
</tr>
<tr>
<td>1</td>
<td>$6(1.05)</td>
</tr>
<tr>
<td>2</td>
<td>$6(1.05)^2</td>
</tr>
</tbody>
</table>

   Value of common stock = Present Value of Expected Dividends.

   The growing dividends go on forever.

   $V = \frac{D_0}{i - g}$
Step 2: Decide on a Solution Strategy

- The value of a share of stock can be viewed as a the present value of a growing perpetuity.
- Here we know the expected dividends, the growth rate, and investor’s required rate of return.
- We can use equation 10–2 to determine the value of a share of common stock.

Step 3: Solve

- We need to first determine $D_1$, the dividend next period.
- Since dividends at the end of last year was $6 and dividends are expected to grow at a rate of 5%, dividends for next period will be:
  - $D_1 = D_0 (1 + g) = $6 (1.05) = $6.30

Step 3: Solve (cont.)

- $V_{cs} = \frac{D_0 (1 + g)}{r_e - g} = \frac{\text{Dividend in year } 1}{\text{Stockholders' Required Rate of Return} - \text{Growth Rate}}$

- $V_{cs} = \frac{$6.30}{0.12 - 0.05}$
- $V_{cs} = \frac{$6.30}{0.07}$
- $V_{cs} = $90$

- Thus the value of common stock is $90.
Equation 10–2 is based on the assumption that dividends will grow at a constant rate forever. While not a realistic assumption, it enables us to determine the value of common stock easily and also help us to identify the factors that move the stock prices.

Equation 10–2 indicates that there are three variables that drive share value:
- The most recent dividend ($D_0$),
- Investor’s required rate of return ($r_c$), and
- Expected rate of growth in future dividends ($g$).

Since most recent dividend ($D_0$) has already been paid, it cannot affect price. Thus the other two variables, $r_c$ and $g$, can vary and lead to changes in stock prices.
Determinants of the Investor's Required Rate of Return

- The investor’s required rate of return is determined by two key factors:
  1. The level of interest rates in the economy; and
  2. The risk of the firm's stock.

In Chapter 8, we used the CAPM to describe the determinants of investor required rate of return.

- CAPM suggests that if risk-free rate and/or systematic risk (beta) rises, the investor’s required rate of return will rise and the stock price will fall.

Determinants of Growth Rate of Future Dividends

- Firm’s growth opportunities relate to:
  - The rate of return the firm expects to earn when they reinvest earnings (the return on equity or ROE), and
  - The proportion of firm’s earnings that they reinvest (known as the retention ratio, b)
The growth rate is formally expressed as follows:

\[
g = \left(1 - \frac{D_1}{E_1}\right) \times \text{Rate of Return on Equity (ROE)}
\]

- \( g \) = the expected rate of growth of dividends
- \( \frac{D_1}{E_1} \) = the dividend payout ratio
- \( b \) = the proportion of firm’s earnings that are retained and reinvested in the firm.
- ROE = the return on equity earned when the firm reinvests a portion of its earnings back into the firm.

10.2 The Comparables Approach to Valuing Common Stock

This method estimates the value of the firm’s stock as a multiple of some measure of firm’s performance, such as the firm’s earnings per share, book value per share, sales per share, cash flow per share, where the multiple is determined by the multiples observed from comparable companies.

The most common metric is earnings per share.
**Define the P/E Ratio Valuation Model**

- Price/Earnings ratio (P/E ratio) is a popular measure of stock valuation.

- P/E ratio is a relative value model because it tells the investor how many dollars investors are willing to pay for each dollar of the company’s earnings.

\[
V_{ct} = \left( \frac{\text{Appropriate Price Earnings Ratio}}{\text{Estimated Earnings Per Share for Year}} \right) \times \frac{P}{E_1}
\]

- \(V_{ct}\) = the value of common stock of the firm.
- \(P/E_1\) = the price earnings ratio for the firm based on the current price per share divided by earnings for end of year 1.
- \(E_1\) = estimated earnings per share of common stock for the end of year 1.

**CheckPoint 10.2 Valuing Common Stock Using the P/E Ratio**

The Heels Shoe Company sells a line of athletic shoes for children and young adults, including sport shoes and other specialty footwear used for various types of sports. The company is privately owned and is considering the sale of a portion of its shares to the public. The company owners are currently in discussions with an investment banker who has offered to manage the sale of shares to the public. The critical point of their discussion is the price that Heels might expect to receive upon the sale of its shares. The investment banker has suggested that this price can be estimated by looking at the P/E multiples of other publicly traded firms that are in the same general business as the Heels Shoe Company and multiplying their average P/E ratio by Heels’ expected EPS for the coming year.

Last year the Heels Shoe Company had earnings of $1.65 per share for the 12-month period ended in March, 2009. Heels’ CFO estimates that company earnings for 2010 will be $1.83 per share.

The investment banker suggested that estimation of an appropriate P/E ratio involves looking at the P/E multiples for similar companies. As a preliminary step, they suggested that Heels’ management team consider the P/E multiples for similar firms, including Deckers Outdoor Corp. (DECK), Nike Inc. (NKE), and Timberland Co. (TBL).

<table>
<thead>
<tr>
<th>Firm</th>
<th>P/E Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deckers</td>
<td>26.65</td>
</tr>
<tr>
<td>Nike</td>
<td>18.79</td>
</tr>
<tr>
<td>Timberland</td>
<td>22.10</td>
</tr>
<tr>
<td>Average</td>
<td>22.41</td>
</tr>
</tbody>
</table>
After some careful analysis and reflection on the valuation of the Heals' shares the company CFO suggested that the earnings projection are too conservative and earnings for the coming year could easily jump to $2.00. What does this do for your estimate of the value of Heals' shares?
Step 1: Picture the Problem

EPS = $2.00

\[ \text{P/E Multiple} \times \text{Stock Price} \]

Step 2: Decide on a Solution Strategy

- The common stock value can be computed by multiplying the firm’s estimated earnings per share for the coming year by what the analyst estimates to be an appropriate P/E ratio.
- We can use equation 10-4 to estimate the value of common stock.

\[ V_{cs} = 22.61 \times \text{EPS} \]

Step 3: Solve

Value of Common Stock: \( V_{cs} = \left( \frac{P}{E_i} \right) \times E_i \)

\[ V_{cs} = 22.61 \times \$2 \]

\[ = \$45.22 \]
Step 4: Analyze

- We estimated the value of Heales’ shares based on the P/E ratios of three comparable firms. However, this estimate is contingent on the appropriateness of the comparable set of companies to the Heals Shoe Company.
- Furthermore, if the market conditions change by the time the shares are sold in the market, the price estimate will not be appropriate.

What Determines the P/E Ratio for a Stock?

- We can investigate the determinants of P/E ratio by observing equations (10-5) and (10-5a):  
  \[ V_{1s} = \frac{D_s (1 + g)}{r_s - g} \]
  \[ P = \frac{D_t / E_t}{r_s - g} \]
  \[ P = \frac{D_t / E_t}{r_s - g} = \frac{D_t / E_t}{r_s - [(1 - D_t / E_t) \times ROE]} \]

- We observe that there are two fundamental determinants of a firm’s P/E ratio:
  1. Growth rate in dividends, and
  2. Investor’s required rate of return.
What Determines the P/E Ratio for a Stock?

- What causes the growth rate in dividends (and earnings) and the investor’s required rate of return to go up and down?
- These are the real determinants of the P/E ratio.
  - Firm factors impacting the investor’s required rate of return,
  - Economic or macro factors impacting the investor’s required rate of return,
  - Firm factors impacting the growth rate – dividend policy and firm investment opportunities.

10.3 Preferred Stock

Features of Preferred Stock

- Dividend:
  - In general, size of preferred stock dividend is fixed, and it is either stated as a dollar amount or as a percentage of the preferred stock’s par value.
  - Unlike common stockholders, preferred stockholders receive the same fixed dividend regardless of how well the firm does.
Multiple Classes:

- If a company chooses, it can issue more than one class of preferred stock, and each class can have different characteristics.
- For example, Public Storage (PSA) has 16 different issues of preferred stock outstanding that vary in terms of dividend, convertibility, seniority.

Claims on Assets and Income:

- In the event of bankruptcy, preferred stockholders have priority over common stock.
- However, they have lower priority than the firm’s debt holders.
- Firm must pay dividends on preferred stock prior to paying dividend on common stock.
Features of Preferred Stock

› Claims on Assets and Income
  - Most preferred stock carry a cumulative feature. Cumulative feature requires that all past unpaid dividends to be paid before any common stock dividends can be declared.
  - Thus preferred stocks are less risky than common stocks but more risky than bonds.

Features of Preferred Stock

› Preferred Stock as a Hybrid Security
  - Like common stocks, preferred stocks do not have a fixed maturity date.
  - Also, like common stocks, nonpayment of dividends does not lead to bankruptcy of the firm.
  - Like debt, preferred stocks have a fixed dividend. Also, most preferred stocks are periodically retired even though there is no stated maturity date.

Valuing Preferred Stock

› Since preferred stockholders generally receive a fixed dividend and the stocks are perpetuities (non-maturing), it can be valued using the present value of perpetuity equation introduced in chapter 6.
Valuing Preferred Stock (cont.)

Value of Preferred Stock = \frac{\text{Annual Preferred Stock Dividend}}{\text{Market's Required Yield on Preferred Stock}}

- \( V_{ps} \) = the value of a share of preferred stock
- \( D_{ps} \) = the annual preferred stock dividend
- \( r_{ps} \) = the market yield or the rate of return on the preferred stock's promised dividend

10.4 The Stock Market
The Stock Market

- New securities trade in the primary market while currently outstanding securities trade in the secondary market.
- The corporation receives money from sale of its securities only in the primary market.

The Stock Market

- There are two types of secondary markets:
  - Organized exchanges where trading occurs at a physical location; and
  - Over-the-counter market where trading occurs over the telephone or through computer networks.

Organized Exchanges

- The New York Stock Exchange (NYSE), also called the "Big Board," is the oldest of all organized exchanges and the largest organized exchange in the world. While the NYSE is considered an organized exchange because of its physical location, the majority of its trades are done electronically without a face-to-face meeting of traders.
Organized Exchanges

- To be listed on the NYSE, a firm must meet strict requirements dealing with profitability and market value, and be widely owned.

- Much of the trading on the NYSE is made up of block trades i.e. transactions involving 10,000 shares or more by a single individual or institution.

Organized Exchanges

- The American Stock Exchange (AMEX) is the nation’s second largest, floor-based exchange.
  - However, in terms of volume, the AMEX is a distant number two with less than 5% of that on the NYSE.

- AMEX merged with NASDAQ in 1998 but continues to operate as a separate entity.

Over-the-Counter (OTC) Market

- The over-the-counter market is a network of dealers that has no listing or membership requirements. Today, the OTC market is electronic with Nasdaq leading the way.

- OTC listings generally include companies too new or too small to be eligible for listing on a major exchange.
Nasdaq debuted in 1971 and is the world's first electronic stock market. While Nasdaq lists more companies than the NYSE, they are relatively smaller companies (with a few exceptions). There are about 1,000 market participants, trading firms that are linked electronically, with price and trading information broadcast to over 350,000 terminals worldwide.

The Nasdaq stock market has two tiers of listed companies:
- Nasdaq National Markets, made up of around 4,000 companies like Dell (D), Intel (INTC); and
- Nasdaq Smallcap Market, which includes over 1,000 smaller emerging growth companies.