Stock valuation

Chapter 10
Principles Applied 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.
- Principle 5: Individuals Respond to Incentives.
Common Stock

- Common stockholders are the owners of the firm.
  - Common stockholders are the residual claimants
- They elect the firm’s board of directors who in turn appoint the firm’s top management team.
- The firm’s management team then carries out the day-to-day management of the firm.
Common Stock Characteristics

- Claim on Income
- Claim on Assets
- Voting Rights
Common Stock Characteristics

Agency Costs and Common Stock
Shareholders elect the board.
Valuing Common Stock Using the Discounted Dividend Model

- The value of an asset is the expected present value of the future cash flows.
  - Bonds have fixed cash flows – interest and principal – and a fixed maturity date
  - Common stocks does not have fixed cash flows – dividends – and no maturity date.
Three Step Procedure for Valuing Common Stock

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

**Step 2:** Evaluate the riskiness of the common stock’s future dividends to determine the stock’s required rate of return.

**Step 3:** Calculate the present value of the expected dividends by discounting them back to the present at the stock’s required rate of return.
The Constant Dividend Growth Rate Model

If a firm’s cash dividend grow by a constant rate, then the dividends are a growing perpetuity:

$$PV = \frac{PMT_{period1}}{i-g}$$

Here, the PMT is the dividend
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 the dividend growing at a rate of 5 percent per year,
- if the investor’s required rate of return is 12% on that stock?
Step 1: Picture the Problem

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

i=12%

Years

Cash flow

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6</td>
<td>$6(1.05)</td>
<td>$6(1.05)^2</td>
<td>...</td>
</tr>
</tbody>
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Value of common stock = Present Value of Expected Dividends.

The growing dividends go on forever
Step 2: Decide on a Solution Strategy

• The value of a share of stock can be viewed as the present value of a growing perpetuity.

• \[ PV = \frac{D_1}{i - g} \]
  - where \( D_1 \) is the period 1 dividend
Step 3: Solve (cont.)

• We need to first determine $D_1$, the dividend next period.
  • $D_1 = D_0 (1+g) = $6 (1.05) = $6.30$

• Now we can calculate the price
  • $P_{cs} = \frac{D_1}{r_{cs} - g}$
  • $= \frac{$6.30}{0.12-0.05} = \frac{$6.30}{0.07}$
  • $= $90$
Step 4: Analyze

This is based on the assumption that dividends will grow at a constant rate for ever.

While not a realistic assumption:

1. It enables us to determine the value of common stock easily and

2. It helps us to identify the factors that move the stock prices.
What Causes Stock Prices to Go Up and Down?

\[ P_{cs} = \frac{D_0(1+g)}{(r_{cs} - g)} \]

This indicates that there are three variables that drive share value:

- The most recent dividend \((D_0)\),
- Investor’s required rate of return \((r_{cs})\), and
- Expected rate of growth in future dividends \((g)\).
Determinants of the Investor’s Required Rate of Return

To determine the required rate of return we can use the CAPM

\[ E(r_{\text{Asset}j}) = r_f + \beta_{\text{Asset}j}[E(r_{\text{Market}}) - r_f] \]
Determinants of the Growth Rate of Future Dividends

The growth rate of future dividends \((g)\) can also change and lead to a change in the stock price. The two key determinants of a firm’s growth opportunities relate to:

- the return on equity (ROE), and
- the retention ratio \((b)\)
Determinants of Growth Rate of Future Dividends

The growth rate is formally expressed as follows:

\[ g = b \times ROE = (1 - \frac{D_1}{E_1}) \times ROE \]

- \( g \) = 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
Valuing Common Stock Using Comparables

- Another approach is to use the value of stocks that are “comparable” to the one we want to value.
  - This method estimates the value of the firm’s stock as a multiple of some measure of firm’s performance.
  - The most common metric is earnings per share.
  - Thus values are determined from the price-to-earnings ratio of comparable firms.
P/E Ratio Valuation Model

- \( P_{cs} = PE \times E_1 \)

- \( P_{cs} \) = the value of common stock of the firm.
- \( PE \) = the price earnings ratio
  - From comparable firms
- \( E_1 \) = estimated earnings per share of common stock for the end of year 1.
CHECKPOINT 10.2: CHECK YOURSELF

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?
P/E Ratio Valuation Model

• Step 1: Picture the problem
  • EPS x (PE) = Price
• Step 2: Decide on a solution strategy
  • We can use the PE ratio valuation model
• Step 3: Solve
  • \[ P_{cs} = 18.20 \times 2 = \] $36.40
• Step 4: Analyze
  • We estimated the value of Heales’ shares based on the P/E ratios.
What Determines the P/E Ratio for a Stock?

• The constant dividend growth model is
  • \( P_{cs} = \frac{D_1}{r_{cs} - g} \)

• Suppose the firm pays a constant fraction of earnings, \( d \), as dividends
  • \( P_{cs} = \frac{dE_1}{r_{cs} - g} \)

• Then the PE ratio is
  • \( P_{cs}/E_1 = \frac{d}{r_{cs} - g} \)
Preferred Stock

Some firms offer **preferred stock** in addition to common stock

- Preferred Stock is a hybrid security:
  - **Like common stocks,**
    - Do not have a fixed maturity date.
    - Nonpayment of dividends does not bring on bankruptcy.
    - Dividends are not deductible for tax purposes.
  - **Like debt,**
    - No voting rights
    - Fixed dividend.
    - Priority over common stock
    - May be retired even though there is no stated maturity date.
The Stock Market

- Newly issued securities trade in the primary market.
- Currently outstanding securities trade in the secondary market.
- There are two types of secondary markets:
  - organized exchanges and
  - over-the-counter markets.
Organized Exchanges

• The New York Stock Exchange (NYSE), also called the “Big Board,” is the oldest of all organized exchanges.
  • 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

• The **American Stock Exchange** (AMEX) is the nation’s second largest, floor-based exchange.
  • However, in terms of trading volume, the AMEX is a distant number two with less than 3% of that on the NYSE.
  • Although AMEX merged with NASDAQ in 1998 it 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 rather than personal, with Nasdaq leading the way.
- Most bonds are traded in the OTC market.
Over-the-Counter (OTC) Market

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.