## Concepts

### Categories of equity valuation models

1. **DCF models** (or **PV models**):
   - **Dividend discount models**: PV of cash distributed to shareholders
   - **Free cash flow to equity models**: PV of cash available to shareholders after the firm meets its necessary CAPEX and Working Cap.

2. **Multiplier models**:
   - Compare stock price to earnings, sales, CF, BV (e.g.: P/E, P/CF, P/S, P/B)
   - Compare enterprise value to EBITDA or revenue (e.g.: EV/EBITDA, EV/Revenue)

3. **Asset-based models**: Total FV of assets - (Total FV of liabilities + Total FV of preferred stocks)

<table>
<thead>
<tr>
<th>Method to estimate growth rate:</th>
</tr>
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<tbody>
<tr>
<td>1. Use historical growth in dividends for the firm</td>
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<td>2. Use industry median of dividend growth rate</td>
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<td>3. Estimate the sustainable growth rate: ( g_s = \left( 1 - \text{dividend payout ratio} \right) \times \text{ROE} )</td>
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### DCF models - Dividend discount model

- **Finite holding period - Dividend discount model**
  \[
  V_0 = \frac{D_1}{k_e - g} + \frac{D_2}{(1 + k_e)^2} + \cdots + \frac{D_t}{(1 + k_e)^t} + \frac{P_t}{(1 + k_e)^t}
  \]
  - In which: \( V_0 \) = current stock price
  - \( D_t \) = Dividend at time \( t \)
  - \( P_t \) = Year end price at time \( t \)
  - \( k_e \) = required rate of return on common equity

- **Infinite holding period - Dividend discount model**
  \[
  V_0 = \frac{D_1}{k_e - g} + \frac{D_2}{(1 + k_e)^2} + \cdots + \frac{D_t}{(1 + k_e)^t} + \frac{P_t}{(1 + k_e)^t}
  \]
  - If no growth (e.g.: preferred stocks):
    \[
    V_0 = \frac{D_1}{k_e}
    \]

### DCF models - FCFE models

- **FCFE = Net income + Depreciation - Increase in Working Cap - Fixed Capital Investment - Debt principal repayment + New debt issues**
- **FCFE = CFO - Fixed capital investment + Net borrowing**

### DCF models - Estimates of growth rate

- Methods to estimate growth rate:
  1. Use historical growth in dividends for the firm
  2. Use industry median of dividend growth rate
  3. Estimate the sustainable growth rate: \( g_s = \left( 1 - \text{dividend payout ratio} \right) \times \text{ROE} \)

### DCF models - Multistage dividend growth models

- **Value of a dividend-paying firm with temporary high growth period, followed by a constant growth period**
  \[
  V_0 = \frac{D_1}{k_e - g} + \frac{D_2}{(1 + k_e)^2} + \cdots + \frac{D_t}{(1 + k_e)^t} + \frac{P_t}{(1 + k_e)^t}
  \]
  - In which: \( P_t = \frac{D_{t+1}}{k_e - g} \)

### Price multiples

- **Include**:
  1. Price multiple (Price - Earnings; Price - Sales; Price - Book value; Price - Cash flow)
  2. Enterprise value multiple (EV / EBITDA; EV / Revenue)
  - In which: \( \text{Enterprise value} = \text{MV of common stock} + \text{MV of preferred stock} + \text{MV of debt} - \text{cash} - \text{ST investments} \)

### Price multiples - Multiple based on fundamentals

- **Justified P/E ratio (leading P/E ratio)**: provide P/E ratio based on PV of future CF
  \[
  P_0 = \frac{D_0}{E_0} \Rightarrow P_0 = \frac{D_0}{E_0} \times \left( \frac{1}{k_e - g} \right)
  \]
  - In which: \( D_0/E_0 \) = expected dividend payout ratio

### Price multiples - Multiple based on Comparables

- **Law of one price**: 2 identical assets should sell at the same price → 2 comparable assets should have the same multiple
  - Companies may not be comparable if firms have different sizes, are in different industries or grow at different rates

### Asset-based models

- **Equity value = MV of assets - MV of liabilities**
  - Most reliable when firms have primarily tangible ST assets, assets with ready MV, or when firms cease to operate and are being liquidated

### Advantages / Disadvantages of Discounted CF models

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td>Based on fundamental concept of discounted PV and are well-grounded in finance theory</td>
<td>Their input must be estimated</td>
</tr>
<tr>
<td>Widely accepted in the analyst community</td>
<td>Value estimates are very sensitive to input values</td>
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