VALUATION: FUTURE GROWTH AND CASH FLOWS

You will be wrong 100% of the time and it is okay.
Set Up and Objective
1: What is corporate finance
2: The Objective: Utopia and Let Down
3: The Objective: Reality and Reaction

The Investment Decision
Invest in assets that earn a return greater than the minimum acceptable hurdle rate

Hurdle Rate
4. Define & Measure Risk
5. The Risk free Rate
6. Equity Risk Premiums
7. Country Risk Premiums
8. Regression Betas
9. Beta Fundamentals
10. Bottom-up Betas
11. The "Right" Beta
12. Debt: Measure & Cost
13. Financing Weights

Investment Return
14. Earnings and Cash flows
15. Time Weighting Cash flows
16. Loose Ends

The Financing Decision
Find the right kind of debt for your firm and the right mix of debt and equity to fund your operations

Financing Mix
17. The Trade off
18. Cost of Capital Approach
19. Cost of Capital: Follow up
20. Cost of Capital: Wrap up
21. Alternative Approaches
22. Moving to the optimal

The Dividend Decision
If you cannot find investments that make your minimum acceptable rate, return the cash to owners of your business

Financing Type
23. The Right Financing

Dividend Policy
24. Trends & Measures
25. The trade off
26. Assessment
27. Action & Follow up
28. The End Game

Valuation
29. First steps
30. Cash flows
31. Growth
32. Terminal Value
33. To value per share
34. The value of control
35. Relative Valuation

36. Closing Thoughts
Historical Growth & Outside Estimates

- **Historical growth** is a function of the time period you look at (starting and ending points), the measure of earnings you look at and a function of your averaging approach. It is also not a particularly good predictor of the future.

- **Outside estimates** (from analysts or managers) is not only biased but tend not to be very good, especially for longer term forecasts.
Expected Growth and Fundamentals

Fundamental Growth

Equity Income
- Retention Ratio = 1 - Dividends/ Net Income
- Return on Equity = Net Income/ BV of Equity

Operating Income
- Reinvestment Rate = (Net Cap Ex + Chg in WC)/ EBIT (1-t)
- Return on Capital = EBIT (1-t)/ (BV of Equity + Debt - Cash)

- In 2007, Deutsche Bank reported net income of 6.51 billion Euros on a book value of equity of 33.475 billion Euros at the start of the year (end of 2006), and paid out 2.146 billion Euros as dividends.

\[
\text{Return on Equity} = \frac{\text{Net Income}_{2007}}{\text{Book Value of Equity}_{2006}} = \frac{6,510}{33,475} = 19.45\%
\]

\[
\text{Retention Ratio} = 1 - \frac{\text{Dividends}}{\text{Net Income}} = 1 - \frac{2,146}{6,510} = 67.03\%
\]

- If Deutsche Bank maintains the return on equity (ROE) and retention ratio that it delivered in 2007 for the long run:

\[
\text{Expected Growth Rate} = 0.6703 \times 0.1945 = 13.04\%
\]

- If we replace the net income in 2007 with average net income of $3,954 million, from 2003 to 2007:

\[
\text{Normalized Return on Equity} = \frac{\text{Average Net Income}_{2003-07}}{\text{Book Value of Equity}_{2006}} = \frac{3,954}{33,475} = 11.81\%
\]

\[
\text{Normalized Retention Ratio} = 1 - \frac{\text{Dividends}}{\text{Net Income}} = 1 - \frac{2,146}{3,954} = 45.72\%
\]

\[
\text{Expected Growth Rate} = 1 - \frac{\text{Dividends}}{\text{Net Income}} = 1 - \frac{2,146}{3,954} = 45.72\%
\]
### Estimating growth in Net Income: Tata Motors

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
<th>Cap Ex</th>
<th>Depreciation</th>
<th>Change in WC</th>
<th>Change in Debt</th>
<th>Equity Reinvestment</th>
<th>Equity Reinvestment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>-25,053₹</td>
<td>99,708₹</td>
<td>25,072₹</td>
<td>13,441₹</td>
<td>25,789₹</td>
<td>62,288₹</td>
<td>-248.63%</td>
</tr>
<tr>
<td>2009-10</td>
<td>29,151₹</td>
<td>84,754₹</td>
<td>39,602₹</td>
<td>-26,009₹</td>
<td>5,605₹</td>
<td>13,538₹</td>
<td>46.44%</td>
</tr>
<tr>
<td>2010-11</td>
<td>92,736₹</td>
<td>81,240₹</td>
<td>46,510₹</td>
<td>50,484₹</td>
<td>24,951₹</td>
<td>60,263₹</td>
<td>64.98%</td>
</tr>
<tr>
<td>2011-12</td>
<td>135,165₹</td>
<td>138,756₹</td>
<td>56,209₹</td>
<td>22,801₹</td>
<td>30,846₹</td>
<td>74,502₹</td>
<td>55.12%</td>
</tr>
<tr>
<td>2012-13</td>
<td>98,926₹</td>
<td>187,570₹</td>
<td>75,648₹</td>
<td>680₹</td>
<td>32,970₹</td>
<td>79,632₹</td>
<td>80.50%</td>
</tr>
<tr>
<td>Aggregate</td>
<td>330,925₹</td>
<td>592,028₹</td>
<td>243,041₹</td>
<td>61,397₹</td>
<td>120,160₹</td>
<td>290,224₹</td>
<td>87.70%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
<th>BV of Equity at start of the year</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>-25,053₹</td>
<td>91,658₹</td>
<td>-27.33%</td>
</tr>
<tr>
<td>2009-10</td>
<td>29,151₹</td>
<td>63,437₹</td>
<td>45.95%</td>
</tr>
<tr>
<td>2010-11</td>
<td>92,736₹</td>
<td>84,200₹</td>
<td>110.14%</td>
</tr>
<tr>
<td>2011-12</td>
<td>135,165₹</td>
<td>194,181₹</td>
<td>69.61%</td>
</tr>
<tr>
<td>2012-13</td>
<td>98,926₹</td>
<td>330,056₹</td>
<td>29.97%</td>
</tr>
<tr>
<td>Aggregate</td>
<td>330,925₹</td>
<td>763,532₹</td>
<td>43.34%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2013 value</th>
<th>Average values: 2008-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinvestment rate</td>
<td>80.50%</td>
<td>87.70%</td>
</tr>
<tr>
<td>ROE</td>
<td>29.97%</td>
<td>43.34%</td>
</tr>
<tr>
<td>Expected growth</td>
<td>24.13%</td>
<td>38.01%</td>
</tr>
</tbody>
</table>
ROE and Leverage

- A high ROE, other things remaining equal, should yield a higher expected growth rate in equity earnings.
- The ROE for a firm is a function of both the quality of its investments and how much debt it uses in funding these investments. In particular

\[
\text{ROE} = \text{ROC} + \frac{\text{D/E} \times (\text{ROC} - i \times (1-t))}{(1-t)}
\]

where,

- \(\text{ROC} = \frac{(\text{EBIT} \times (1 - \text{tax rate}))}{(\text{Book Value of Capital})}\)
- \(\text{BV of Capital} = \text{BV of Debt} + \text{BV of Equity} - \text{Cash}\)
- \(\text{D/E} = \frac{\text{Debt}}{\text{Equity}}\) ratio
- \(i = \text{Interest rate on debt}\)
- \(t = \text{Tax rate on ordinary income.}\)
Decomposing ROE

- Assume that you are analyzing a company with a 15% return on capital, an after-tax cost of debt of 5% and a book debt to equity ratio of 100%. Estimate the ROE for this company.

- Now assume that another company in the same sector has the same ROE as the company that you have just analyzed but no debt. Will these two firms have the same growth rates in earnings per share if they have the same dividend payout ratio?

- Will they have the same equity value?
Estimating Growth in EBIT: Disney

- We started with the reinvestment rate that we computed from the 2013 financial statements:
  \[
  \text{Reinvestment rate} = \frac{3.629 + 103}{10,032 (1 - .3102)} = 53.93\%
  \]
  We computed the reinvestment rate from the 2013 financial statements to ensure that the 2013 values were not unusual or outliers.

- We compute the return on capital, using operating income in 2013 and capital invested at the start of the year:
  \[
  \text{Return on Capital}_{2013} = \frac{\text{EBIT} (1-t)}{(\text{BV of Equity} + \text{BV of Debt} - \text{Cash})}
  \]
  Disney’s return on capital is \( \frac{10,032 (1-.361)}{(41,958 + 16,328 - 3,387)} = 12.61\% \) in the last two years.

- If Disney maintains its 2013 reinvestment rate and return on capital for the next five years, its growth rate will be 6.80 percent.
  \[
  \text{Expected Growth Rate from Existing Fundamentals} = 53.93\% \times 12.61\% = 6.8\%
  \]
When everything is in flux: Changing growth and margins

- The elegant connection between reinvestment and growth in operating income breaks down, when you have a company in transition, where margins are changing over time.

- If that is the case, you have to estimate cash flows in three steps:
  - Forecast revenue growth and revenues in future years, taking into account market potential and competition.
  - Forecast a “target” margin in the future and a pathway from current margins to the target.
  - Estimate reinvestment from revenues, using a sales to capital ratio (measuring the dollars of revenues you get from each dollar of investment).
Here is an example: Baidu’s Expected FCFF

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue growth</th>
<th>Revenues</th>
<th>Operating Margin</th>
<th>EBIT</th>
<th>Tax rate</th>
<th>EBIT (1-t)</th>
<th>Chg in Revenues</th>
<th>Sales/ Capital</th>
<th>Reinvestm ent</th>
<th>FCFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year</td>
<td></td>
<td>$28,756</td>
<td>48.72%</td>
<td>$14,009</td>
<td>16.31%</td>
<td>$11,724</td>
<td>2.64</td>
<td></td>
<td>$2,722</td>
<td>$11,521</td>
</tr>
<tr>
<td>1</td>
<td>25.00%</td>
<td>$35,945</td>
<td>47.35%</td>
<td>$17,019</td>
<td>16.31%</td>
<td>$14,243</td>
<td>$7,189</td>
<td>2.64</td>
<td>$2,722</td>
<td>$11,521</td>
</tr>
<tr>
<td>2</td>
<td>25.00%</td>
<td>$44,931</td>
<td>45.97%</td>
<td>$20,657</td>
<td>16.31%</td>
<td>$17,288</td>
<td>$8,986</td>
<td>2.64</td>
<td>$3,403</td>
<td>$13,885</td>
</tr>
<tr>
<td>3</td>
<td>25.00%</td>
<td>$56,164</td>
<td>44.60%</td>
<td>$25,051</td>
<td>16.31%</td>
<td>$20,965</td>
<td>$11,233</td>
<td>2.64</td>
<td>$4,253</td>
<td>$16,712</td>
</tr>
<tr>
<td>4</td>
<td>25.00%</td>
<td>$70,205</td>
<td>43.23%</td>
<td>$30,350</td>
<td>16.31%</td>
<td>$25,400</td>
<td>$14,041</td>
<td>2.64</td>
<td>$5,316</td>
<td>$20,084</td>
</tr>
<tr>
<td>5</td>
<td>25.00%</td>
<td>$87,756</td>
<td>41.86%</td>
<td>$36,734</td>
<td>16.31%</td>
<td>$30,743</td>
<td>$17,551</td>
<td>2.64</td>
<td>$6,646</td>
<td>$24,097</td>
</tr>
<tr>
<td>6</td>
<td>20.70%</td>
<td>$105,922</td>
<td>40.49%</td>
<td>$42,885</td>
<td>18.05%</td>
<td>$35,145</td>
<td>$18,166</td>
<td>2.64</td>
<td>$6,878</td>
<td>$28,267</td>
</tr>
<tr>
<td>7</td>
<td>16.40%</td>
<td>$123,293</td>
<td>39.12%</td>
<td>$48,227</td>
<td>19.79%</td>
<td>$38,685</td>
<td>$17,371</td>
<td>2.64</td>
<td>$6,577</td>
<td>$32,107</td>
</tr>
<tr>
<td>8</td>
<td>12.10%</td>
<td>$138,212</td>
<td>37.74%</td>
<td>$52,166</td>
<td>21.52%</td>
<td>$40,938</td>
<td>$14,918</td>
<td>2.64</td>
<td>$5,649</td>
<td>$35,289</td>
</tr>
<tr>
<td>9</td>
<td>7.80%</td>
<td>$148,992</td>
<td>36.37%</td>
<td>$54,191</td>
<td>23.26%</td>
<td>$41,585</td>
<td>$10,781</td>
<td>2.64</td>
<td>$4,082</td>
<td>$37,503</td>
</tr>
<tr>
<td>10</td>
<td>3.50%</td>
<td>$154,207</td>
<td>35.00%</td>
<td>$53,972</td>
<td>25.00%</td>
<td>$40,479</td>
<td>$5,215</td>
<td>2.64</td>
<td>$1,974</td>
<td>$38,505</td>
</tr>
</tbody>
</table>
Task
Estimate the expected growth/future cash flows for your firm.