Cynic: A person who knows the price of everything but the value of nothing.
Oscar Wilde
First Principles

Maximize the value of the business (firm)

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

- **The hurdle rate** should reflect the riskiness of the investment and the mix of debt and equity used to fund it.
- **The return** should reflect the magnitude and the timing of the cashflows as well as all side effects.

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

- The optimal mix of debt and equity maximizes firm value
- The right kind of debt matches the tenor of your assets

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

- How much cash you can return depends upon current & potential investment opportunities
- How you choose to return cash to the owners will depend on whether they prefer dividends or buybacks

Aswath Damodaran
Three approaches to valuation

- **Intrinsic valuation**: The value of an asset is a function of its fundamentals – cash flows, growth and risk. In general, discounted cash flow models are used to estimate intrinsic value.

- **Relative valuation**: The value of an asset is estimated based upon what investors are paying for similar assets. In general, this takes the form of value or price multiples and comparing firms within the same business.

- **Contingent claim valuation**: When the cash flows on an asset are contingent on an external event, the value can be estimated using option pricing models.
One tool for estimating intrinsic value: Discounted Cash Flow Valuation

- **Cash flows from existing assets**
  The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

- **Value of growth**
  The future cash flows will reflect expectations of how quickly earnings will grow in the future (as a positive) and how much the company will have to reinvest to generate that growth (as a negative). The net effect will determine the value of growth.
  Expected Cash Flow in year t = E(CF) = Expected Earnings in year t - Reinvestment needed for growth

- **Expected Cash Flow in year t**
  \[ E(CF) = \frac{E(CF_1)}{(1 + r)^1} + \frac{E(CF_2)}{(1 + r)^2} + \frac{E(CF_3)}{(1 + r)^3} + \ldots + \frac{E(CF_n)}{(1 + r)^n} \]

- **Steady state**
  The value of growth comes from the capacity to generate excess returns. The length of your growth period comes from the strength & sustainability of your competitive advantages.

- **Risk in the Cash flows**
  The risk in the investment is captured in the discount rate as a beta in the cost of equity and the default spread in the cost of debt.
Equity Valuation

- The value of equity is obtained by discounting expected cashflows to equity, i.e., the residual cashflows after meeting all expenses, tax obligations and interest and principal payments, at the cost of equity, i.e., the rate of return required by equity investors in the firm.

\[
\text{Value of Equity} = \sum_{t=1}^{t=n} \frac{\text{CF to Equity}_t}{(1+k_e)^t}
\]

where,

- \( \text{CF to Equity}_t \) = Expected Cashflow to Equity in period \( t \)
- \( k_e \) = Cost of Equity

- The dividend discount model is a specialized case of equity valuation, and the value of a stock is the present value of expected future dividends.
The value of the firm is obtained by discounting expected cashflows to the firm, i.e., the residual cashflows after meeting all operating expenses and taxes, but prior to debt payments, at the weighted average cost of capital, which is the cost of the different components of financing used by the firm, weighted by their market value proportions.

\[
\text{Value of Firm} = \sum_{t=1}^{t=n} \frac{\text{CF to Firm}_t}{(1 + \text{WACC})^t}
\]

where,

- \( \text{CF to Firm}_t \) = Expected Cashflow to Firm in period \( t \)
- \( \text{WACC} \) = Weighted Average Cost of Capital
Choosing a Cash Flow to Discount

- When you cannot estimate the free cash flows to equity or the firm, the only cash flow that you can discount is dividends. For financial service firms, it is difficult to estimate free cash flows. For Deutsche Bank, we will be discounting dividends.

- If a firm’s debt ratio is not expected to change over time, the free cash flows to equity can be discounted to yield the value of equity. For Tata Motors, we will discount free cash flows to equity.

- If a firm’s debt ratio might change over time, free cash flows to equity become cumbersome to estimate. Here, we would discount free cash flows to the firm. For Vale and Disney, we will discount the free cash flow to the firm.
The Ingredients that determine value.

Cashflows can be
a. After debt payments to equity
   - Dividends
   - Free Cashflow to Equity
b. Before debt payments to firm
   - Free Cashflow to Firm

Growth rate can be
a. In Equity Earnings
   - Net Income
   - Earnings per share
b. In Operating Earnings

Firm is in stable growth which it can sustain forever

Expected Cashflows during extraordinary growth phase

Discount the cashflows and terminal value to the present

Discount Rate can be
a. Cost of equity, if cashflows are equity cashflows
b. Cost of capital, if cashflows are to the firm
I. Estimating Cash Flows
Dividends and Modified Dividends for Deutsche Bank

- In 2007, Deutsche Bank paid out dividends of 2,146 million Euros on net income of 6,510 million Euros. In early 2008, we valued Deutsche Bank using the dividends it paid in 2007. In my 2008 valuation I am assuming the dividends are not only reasonable but sustainable.

- In November 2013, Deutsche Bank’s dividend policy was in flux. Not only did it report losses but it was on a pathway to increase its regulatory capital ratio. Rather than focus on the dividends (which were small), we estimated the potential dividends (by estimating the free cash flows to equity after investments in regulatory capital)

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Steady state</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Base</strong></td>
<td>€439,851</td>
<td>€453,047</td>
<td>€466,638</td>
<td>€480,637</td>
<td>€495,056</td>
<td>€509,908</td>
<td>€517,556</td>
</tr>
<tr>
<td><strong>Capital ratio</strong></td>
<td>15.13%</td>
<td>15.71%</td>
<td>16.28%</td>
<td>16.85%</td>
<td>17.43%</td>
<td>18.00%</td>
<td>18.00%</td>
</tr>
<tr>
<td><strong>Tier 1 Capital</strong></td>
<td>€66,561</td>
<td>€71,156</td>
<td>€75,967</td>
<td>€81,002</td>
<td>€86,271</td>
<td>€91,783</td>
<td>€93,160</td>
</tr>
<tr>
<td><strong>Change in regulatory capital</strong></td>
<td>€4,595</td>
<td>€4,811</td>
<td>€5,035</td>
<td>€5,269</td>
<td>€5,512</td>
<td>€1,377</td>
<td></td>
</tr>
<tr>
<td><strong>Book Equity</strong></td>
<td>€76,829</td>
<td>€81,424</td>
<td>€86,235</td>
<td>€91,270</td>
<td>€96,539</td>
<td>€102,051</td>
<td>€103,605</td>
</tr>
<tr>
<td><strong>ROE</strong></td>
<td>-1.08%</td>
<td>0.74%</td>
<td>2.55%</td>
<td>4.37%</td>
<td>6.18%</td>
<td>8.00%</td>
<td>8.00%</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>-716 C</td>
<td>602 C</td>
<td>2,203 C</td>
<td>3,988 C</td>
<td>5,971 C</td>
<td>8,164 C</td>
<td>8,287 C</td>
</tr>
<tr>
<td>- Investment in Regulatory Capital</td>
<td>-4,595 C</td>
<td>-4,811 C</td>
<td>-5,035 C</td>
<td>-5,269 C</td>
<td>-5,512 C</td>
<td>-1,554 C</td>
<td></td>
</tr>
<tr>
<td><strong>FCFE</strong></td>
<td>-3,993 C</td>
<td>-2,608 C</td>
<td>-1,047 C</td>
<td>702 C</td>
<td>2,652 C</td>
<td>6,733 C</td>
<td></td>
</tr>
</tbody>
</table>

Aswath Damodaran
## Estimating FCFE (past) : 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>
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<td>25,789₹</td>
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</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>
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<td>46,510₹</td>
<td>50,484₹</td>
<td>24,951₹</td>
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<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>
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<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>
In the fiscal year ended September 2013, Disney reported the following:

- Operating income (adjusted for leases) = $10,032 million
- Effective tax rate = 31.02%
- Capital Expenditures (including acquisitions) = $5,239 million
- Depreciation & Amortization = $2,192 million
- Change in non-cash working capital = $103 million

The free cash flow to the firm can be computed as follows:

\[
\begin{align*}
\text{After-tax Operating Income} & = 10,032 \times (1 - 0.3102) = 6,920 \\
\text{- Net Cap Expenditures} & = 5,239 - 2,192 = 3,629 \\
\text{- Change in Working Capital} & = 103 \\
\text{= Free Cashflow to Firm (FCFF)} & = 3,188
\end{align*}
\]

The reinvestment and reinvestment rate are as follows:

- Reinvestment = 3,629 + 103 = 3,732 million
- Reinvestment Rate = 3,732 / 6,920 = 53.93%
II. Discount Rates

- Critical ingredient in discounted cashflow valuation. Errors in estimating the discount rate or mismatching cashflows and discount rates can lead to serious errors in valuation.

- At an intuitive level, the discount rate used should be consistent with both the riskiness and the type of cashflow being discounted.

- The cost of equity is the rate at which we discount cash flows to equity (dividends or free cash flows to equity). The cost of capital is the rate at which we discount free cash flows to the firm.
Cost of Equity: Deutsche Bank
2008 versus 2013

- In early 2008, we estimated a beta of 1.162 for Deutsche Bank, which used in conjunction with the Euro risk-free rate of 4% (in January 2008) and an equity risk premium of 4.50%, yielded a cost of equity of 9.23%.

\[
\text{Cost of Equity}_{\text{Jan 2008}} = \text{Riskfree Rate}_{\text{Jan 2008}} + \text{Beta} \times \text{Mature Market Risk Premium}
\]
\[
= 4.00\% + 1.162 \times (4.5\%) = 9.23\%
\]

- In November 2013, the Euro riskfree rate had dropped to 1.75% and the Deutsche’s equity risk premium had risen to 6.12%:

\[
\text{Cost of equity}_{\text{Nov ‘13}} = \text{Riskfree Rate}_{\text{Nov ‘13}} + \text{Beta} \times (\text{ERP})
\]
\[
= 1.75\% + 1.1516 \times (6.12\%) = 8.80\%
\]
Cost of Equity: Tata Motors

- We will be valuing Tata Motors in rupee terms. That is a choice. Any company can be valued in any currency.

- Earlier, we estimated a levered beta for equity of 1.1007 for Tata Motor’s operating assets. Since we will be discounting FCFE with the income from cash included in the cash, we recomputed a beta for Tata Motors as a company (with cash):

\[
\text{Levered Beta}_{\text{Company}} = 1.1007 \times \frac{1428}{1630} + 0 \times \frac{202}{1630} = 0.964
\]

- With a nominal rupee risk-free rate of 6.57 percent and an equity risk premium of 7.19% for Tata Motors, we arrive at a cost of equity of 13.50%.

\[
\text{Cost of Equity} = 6.57\% + 0.964 \times (7.19\%) = 13.50\%
\]
Current Cost of Capital: Disney

- The beta for Disney’s stock in November 2013 was 1.0013. The T. bond rate at that time was 2.75%. Using an estimated equity risk premium of 5.76%, we estimated the cost of equity for Disney to be 8.52%:

  \[
  \text{Cost of Equity} = 2.75\% + 1.0013(5.76\%) = 8.52\%
  \]

- Disney’s bond rating in May 2009 was A, and based on this rating, the estimated pretax cost of debt for Disney is 3.75%. Using a marginal tax rate of 36.1, the after-tax cost of debt for Disney is 2.40%.

  \[
  \text{After-Tax Cost of Debt} = 3.75\% (1 - 0.361) = 2.40\%
  \]

- The cost of capital was calculated using these costs and the weights based on market values of equity (121,878) and debt (15,961):

  \[
  \text{Cost of capital} = 8.52\% \frac{121,878}{(15,961+121,878)} + 2.40\% \frac{15,961}{(15,961+121,878)} = 7.81\%
  \]

Aswath Damodaran
But costs of equity and capital can and should change over time...

<table>
<thead>
<tr>
<th>Year</th>
<th>Beta</th>
<th>Cost of Equity</th>
<th>After-tax Cost of Debt</th>
<th>Debt Ratio</th>
<th>Cost of capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0013</td>
<td>8.52%</td>
<td>2.40%</td>
<td>11.50%</td>
<td>7.81%</td>
</tr>
<tr>
<td>2</td>
<td>1.0013</td>
<td>8.52%</td>
<td>2.40%</td>
<td>11.50%</td>
<td>7.81%</td>
</tr>
<tr>
<td>3</td>
<td>1.0013</td>
<td>8.52%</td>
<td>2.40%</td>
<td>11.50%</td>
<td>7.81%</td>
</tr>
<tr>
<td>4</td>
<td>1.0013</td>
<td>8.52%</td>
<td>2.40%</td>
<td>11.50%</td>
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</tr>
<tr>
<td>5</td>
<td>1.0013</td>
<td>8.52%</td>
<td>2.40%</td>
<td>11.50%</td>
<td>7.81%</td>
</tr>
<tr>
<td>6</td>
<td>1.0010</td>
<td>8.52%</td>
<td>2.40%</td>
<td>13.20%</td>
<td>7.71%</td>
</tr>
<tr>
<td>7</td>
<td>1.0008</td>
<td>8.51%</td>
<td>2.40%</td>
<td>14.90%</td>
<td>7.60%</td>
</tr>
<tr>
<td>8</td>
<td>1.0005</td>
<td>8.51%</td>
<td>2.40%</td>
<td>16.60%</td>
<td>7.50%</td>
</tr>
<tr>
<td>9</td>
<td>1.0003</td>
<td>8.51%</td>
<td>2.40%</td>
<td>18.30%</td>
<td>7.39%</td>
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<tr>
<td>10</td>
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<td>2.40%</td>
<td>20.00%</td>
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</tr>
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</table>
III. Expected Growth

- **Net Income**
  - Retention Ratio = 1 - Dividends/Net Income
  - Return on Equity = Net Income/Book Value of Equity

- **Operating Income**
  - Reinvestment Rate = (Net Cap Ex + Chg in WC)/EBIT(1-t)
  - Return on Capital = EBIT(1-t)/Book Value of Capital

Expected Growth = Net Income \times Return on Equity \times Reinvestment Rate \times Return on Capital

- 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:

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

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

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

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

  \[
  \text{Expected Growth Rate} = \text{Normalized Fundamentals} = 0.4572 \times 0.1181 = 5.40% 
  \]
## Estimating growth in Net Income: Tata Motors

### Yearly Financial Analysis

<table>
<thead>
<tr>
<th>Year</th>
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</tr>
</tbody>
</table>

### BV of Equity and ROE Analysis

<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>

Aswath Damodaran
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

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

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 in prior years 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:
  \[
  \text{Return on Capital}_{2013} = \frac{\text{EBIT} (1-t)}{(\text{BV of Equity} + \text{BV of Debt} - \text{Cash})} = \frac{10,032 (1-.361)}{(41,958 + 16,328 - 3,387)} = 12.61\%
  \]
  Disney’s return on capital has improved gradually over the last decade and has levelled off 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>Base Year</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenue growth</td>
<td>Revenues</td>
<td>Operating Margin</td>
<td>EBIT</td>
<td>Tax rate</td>
<td>EBIT (1-t)</td>
<td>Chg in Revenues</td>
<td>Sales/ Capital</td>
<td>Reinvestm ent</td>
<td>FCFF</td>
<td></td>
</tr>
<tr>
<td>Base year</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>$2,722</td>
<td>$11,521</td>
<td></td>
<td></td>
<td></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>$3,403</td>
<td>$13,885</td>
<td></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>$4,253</td>
<td>$16,712</td>
<td></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>$5,316</td>
<td>$20,084</td>
<td></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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
</tbody>
</table>
IV. Getting Closure in Valuation

- Since we cannot estimate cash flows forever, we estimate cash flows for a “growth period” and then estimate a terminal value, to capture the value at the end of the period:

\[
\text{Value} = \sum_{t=1}^{t=N} \frac{\text{CF}_t}{(1+r)^t} + \frac{\text{Terminal Value}}{(1+r)^N}
\]

- When a firm’s cash flows grow at a “constant” rate forever, the present value of those cash flows can be written as:

Value = Expected Cash Flow Next Period / (r - g)

where,

- \( r \) = Discount rate (Cost of Equity or Cost of Capital)
- \( g \) = Expected growth rate forever.

- This “constant” growth rate is called a stable growth rate and cannot be higher than the growth rate of the economy in which the firm operates.
Getting to stable growth...

- A key assumption in all discounted cash flow models is the period of high growth, and the pattern of growth during that period. In general, we can make one of three assumptions:
  - there is no high growth, in which case the firm is already in stable growth
  - there will be high growth for a period, at the end of which the growth rate will drop to the stable growth rate (2-stage)
  - there will be high growth for a period, at the end of which the growth rate will decline gradually to a stable growth rate (3-stage)

- The assumption of how long high growth will continue will depend upon several factors including:
  - the size of the firm (larger firm -> shorter high growth periods)
  - current growth rate (if high -> longer high growth period)
  - barriers to entry and differential advantages (if high -> longer growth period)
## Choosing a Growth Period: Examples

<table>
<thead>
<tr>
<th>Firm size/market size</th>
<th>Disney</th>
<th>Vale</th>
<th>Tata Motors</th>
<th>Baidu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm is one of the largest players in the entertainment and theme park business, but the businesses are being redefined and are expanding.</td>
<td>The company is one of the largest mining companies in the world, and the overall market is constrained by limits on resource availability.</td>
<td>Firm has a large market share of Indian (domestic) market, but it is small by global standards. Growth is coming from Jaguar division in emerging markets.</td>
<td>Company is in a growing sector (online search) in a growing market (China).</td>
<td></td>
</tr>
<tr>
<td>Current excess returns</td>
<td>Firm is earning more than its cost of capital.</td>
<td>Returns on capital are largely a function of commodity prices. Have generally exceeded the cost of capital.</td>
<td>Firm has a return on capital that is higher than the cost of capital.</td>
<td>Firm earns significant excess returns.</td>
</tr>
<tr>
<td>Competitive advantages</td>
<td>Has some of the most recognized brand names in the world. Its movie business now houses Marvel superheros, Pixar animated characters &amp; Star Wars.</td>
<td>Cost advantages because of access to low-cost iron ore reserves in Brazil.</td>
<td>Has wide distribution/service network in India but competitive advantages are fading there. Competitive advantages in India are fading but Landrover/Jaguar has strong brand name value, giving Tata pricing power and growth potential.</td>
<td>Early entry into &amp; knowledge of the Chinese market, coupled with government-imposed barriers to entry on outsiders.</td>
</tr>
<tr>
<td>Length of high-growth period</td>
<td>Ten years, entirely because of its strong competitive advantages/</td>
<td>None, though with normalized earnings and moderate excess returns.</td>
<td>Five years, with much of the growth coming from outside India.</td>
<td>Ten years, with strong excess returns.</td>
</tr>
</tbody>
</table>
Valuing Vale in November 2013 (in US dollars)

Let's start with some history & estimate what a normalized year will look like

Assume that the company is in stable growth, growing 2% a year in perpetuity

Estimate the costs of equity & capital for Vale

<table>
<thead>
<tr>
<th>Business</th>
<th>Sample size</th>
<th>Unlevered beta of business</th>
<th>Revenues</th>
<th>Peer Group EV/Sales</th>
<th>Value of Business</th>
<th>Proportion of Vale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals &amp; Min</td>
<td>48</td>
<td>0.86</td>
<td>$9,013</td>
<td>1.97</td>
<td>$17,739</td>
<td>16.65%</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>78</td>
<td>0.83</td>
<td>$32,717</td>
<td>2.48</td>
<td>$81,188</td>
<td>76.20%</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>693</td>
<td>0.99</td>
<td>$3,777</td>
<td>1.52</td>
<td>$5,741</td>
<td>5.39%</td>
</tr>
<tr>
<td>Logistics</td>
<td>223</td>
<td>0.75</td>
<td>$1,644</td>
<td>1.14</td>
<td>$1,874</td>
<td>1.76%</td>
</tr>
<tr>
<td>Vale Operations</td>
<td>0.8440</td>
<td></td>
<td>$47,151</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Market D/E = 54.99%
Marginal tax rate = 34.00% (Brazil)
Levered Beta = 0.844 (1+(1-.34)(.5499)) = 1.15
Cost of equity = 2.75% + 1.15 (7.38%) = 10.87%

Cost of capital = 11.23% (.6452) + 4.05% (1-.34) (.3548) = 8.20%

Assume that the company is in stable growth, growing 2% a year in perpetuity

Reinvestment Rate = \[ \frac{g}{ROC} = \frac{2\%}{17.25\%} = 11.59\% \]

Value of Operating Assets = \[ \frac{17,626 (1 -.2092)(1 -.1159)}{(.082 -.02)} = \$202,832 \]

Value of operating assets = $202,832
+ Cash & Marketable Securities = $ 7,133
- Debt = $ 42,879
Value of equity = $167,086
Value per share =$ 32.44
Stock price (11/2013) = $ 13.57
Estimating Stable Period Inputs after a high growth period: Disney

- **Respect the cap**: The growth rate forever is assumed to be 2.5. This is set lower than the riskfree rate (2.75%).

- **Stable period excess returns**: The return on capital for Disney will drop from its high growth period level of 12.61% to a stable growth return of 10%. This is still higher than the cost of capital of 7.29% but the competitive advantages that Disney has are unlikely to dissipate completely by the end of the 10th year.

- **Reinvest to grow**: Based on the expected growth rate in perpetuity (2.5%) and expected return on capital forever after year 10 of 10%, we compute a stable period reinvestment rate of 25%:
  - Reinvestment Rate = Growth Rate / Return on Capital = 2.5% / 10% = 25%

- **Adjust risk and cost of capital**: The beta for the stock will drop to one, reflecting Disney’s status as a mature company.
  - Cost of Equity = Riskfree Rate + Beta * Risk Premium = 2.75% + 5.76% = 8.51%
  - The debt ratio for Disney will rise to 20%. Since we assume that the cost of debt remains unchanged at 3.75%, this will result in a cost of capital of 7.29%
  - Cost of capital = 8.51% (.80) + 3.75% (1-.361) (.20) = 7.29%

Aswath Damodaran
V. From firm value to equity value per share

<table>
<thead>
<tr>
<th>Approach used</th>
<th>To get to equity value per share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount dividends per share at the cost of equity</td>
<td>Present value is value of equity per share</td>
</tr>
<tr>
<td>Discount aggregate FCFE at the cost of equity</td>
<td>Present value is value of aggregate equity. Subtract the value of equity options given to managers and divide by number of shares.</td>
</tr>
<tr>
<td>Discount aggregate FCFF at the cost of capital</td>
<td>PV = Value of operating assets + Cash &amp; Near Cash investments + Value of minority cross holdings -Debt outstanding = Value of equity -Value of equity options = Value of equity in common stock / Number of shares</td>
</tr>
</tbody>
</table>
To value Deutsche Bank, we started with the normalized income over the previous five years (3,954 million Euros) and the dividends in 2008 (2,146 million Euros). We assumed that the payout ratio and ROE, based on these numbers will continue for the next 5 years:

- Payout ratio = 2,146/3954 = 54.28%
- Expected growth rate = (1-.5428) * .1181 = 0.054 or 5.4%
- Cost of equity = 9.23%

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
<th>Payout Ratio</th>
<th>Dividends</th>
<th>PV @ 9.23%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>4,167 €</td>
<td>54.28%</td>
<td>2,262 €</td>
<td>2,071 €</td>
</tr>
<tr>
<td>2009</td>
<td>4,392 €</td>
<td>54.28%</td>
<td>2,384 €</td>
<td>1,998 €</td>
</tr>
<tr>
<td>2010</td>
<td>4,629 €</td>
<td>54.28%</td>
<td>2,513 €</td>
<td>1,928 €</td>
</tr>
<tr>
<td>2011</td>
<td>4,879 €</td>
<td>54.28%</td>
<td>2,648 €</td>
<td>1,861 €</td>
</tr>
<tr>
<td>2012</td>
<td>5,143 €</td>
<td>54.28%</td>
<td>2,791 €</td>
<td>1,795 €</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,653 €</td>
</tr>
</tbody>
</table>
Deutsche Bank in stable growth

- At the end of year 5, the firm is in stable growth. We assume that the cost of equity drops to 8.5% (as the beta moves to 1) and that the return on equity also drops to 8.5 (to equal the cost of equity).

  Stable Period Payout Ratio = 1 – g/ROE = 1 – 0.03/0.085 = 0.6471 or 64.71%

  Expected Dividends in Year 6 = Expected Net Income\textsubscript{5} *(1+g\textsubscript{Stable})* Stable Payout Ratio
  = €5,143 \times 1.03 \times 0.6471 = €3,427 million

  Terminal Value = \frac{\text{Expected Dividends}\textsubscript{6}}{(\text{Cost of Equity-g})} = \frac{3,247}{0.085-0.03} = 62,318 million Euros

  PV of Terminal Value = \frac{\text{Terminal Value}\textsubscript{n}}{(1+\text{Cost of Equity}_{\text{High growth}})^n} = \frac{62,318}{(1.0923)^5} = 40,079 mil Euros

- Value of equity = €9,653 + €40,079 = €49,732 million Euros

- Value of equity per share = \frac{\text{Value of Equity}}{\# \text{ Shares}} = \frac{49,732}{474.2} = 104.88 Euros/share

  Stock was trading at 89 Euros per share at the time of the analysis.
### Valuing Deutsche Bank in 2013

<table>
<thead>
<tr>
<th>Risk Adjusted Assets (grows 3% a year for next 5 years)</th>
<th>Current</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Steady state</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>439,851 €</td>
<td>453,047 €</td>
<td>466,638 €</td>
<td>480,637 €</td>
<td>495,056 €</td>
<td>509,908 €</td>
<td>517,556 €</td>
</tr>
<tr>
<td>Tier 1 Capital ratio (increases from 15.13% to 18.00% over next 5 years)</td>
<td>15.13%</td>
<td>15.71%</td>
<td>16.28%</td>
<td>16.85%</td>
<td>17.43%</td>
<td>18.00%</td>
<td>18.00%</td>
</tr>
<tr>
<td>Tier 1 Capital (Risk Adjusted Assets * Tier 1 Capital Ratio)</td>
<td>66,561 €</td>
<td>71,156 €</td>
<td>75,967 €</td>
<td>81,002 €</td>
<td>86,271 €</td>
<td>91,783 €</td>
<td>93,160 €</td>
</tr>
<tr>
<td>Change in regulatory capital (Tier 1)</td>
<td>4,595 €</td>
<td>4,811 €</td>
<td>5,035 €</td>
<td>5,269 €</td>
<td>5,512 €</td>
<td>1,377 €</td>
<td></td>
</tr>
<tr>
<td>Book Equity</td>
<td>76,829 €</td>
<td>81,424 €</td>
<td>86,235 €</td>
<td>91,270 €</td>
<td>96,539 €</td>
<td>102,051 €</td>
<td>103,605 €</td>
</tr>
<tr>
<td>ROE (expected to improve from -1.08% to 8.00% in year 5)</td>
<td>-1.08%</td>
<td>0.74%</td>
<td>2.55%</td>
<td>4.37%</td>
<td>6.18%</td>
<td>8.00%</td>
<td>8.00%</td>
</tr>
<tr>
<td>Net Income (Book Equity * ROE)</td>
<td>-716 €</td>
<td>602 €</td>
<td>2,203 €</td>
<td>3,988 €</td>
<td>5,971 €</td>
<td>8,164 €</td>
<td>8,287 €</td>
</tr>
<tr>
<td>- Investment in Regulatory Capital</td>
<td>4,595 €</td>
<td>4,811 €</td>
<td>5,035 €</td>
<td>5,269 €</td>
<td>5,512 €</td>
<td>1,554 €</td>
<td></td>
</tr>
<tr>
<td>FCFE</td>
<td>-3,993 €</td>
<td>-2,608 €</td>
<td>-1,047 €</td>
<td>702 €</td>
<td>2,652 €</td>
<td>6,733 €</td>
<td></td>
</tr>
<tr>
<td>Terminal value of equity</td>
<td>103,582.19 €</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present value</td>
<td>-3,669.80 €</td>
<td>-2,202.88 €</td>
<td>-812.94 €</td>
<td>500.72 €</td>
<td>69,671.28 €</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of equity</td>
<td>8.80%</td>
<td>8.80%</td>
<td>8.80%</td>
<td>8.80%</td>
<td>8.80%</td>
<td>8.80%</td>
<td></td>
</tr>
<tr>
<td>Value of equity today =</td>
<td>63,486.39 €</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of shares outstanding =</td>
<td>1019.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value per share =</td>
<td>62.27 €</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock price in November 2013 =</td>
<td>35.46 €</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Valuing Tata Motors with a FCFE model in November 2013: The high growth period

- We use the expected growth rate of 24.13%, estimated based upon the 2013 values for ROE (29.97%) and equity reinvestment rate (80.5%):
  - Expected growth rate $= 29.97\% \times 80.5\% = 24.13\%$

- The cost of equity for Tata Motors is 13.50%:
  - Cost of equity $= 6.57\% + 0.964 \times (7.19\%) = 13.50\%$

- The expected FCFE for the high growth period

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Income</td>
<td>₹98,926</td>
<td>₹122,794</td>
<td>₹152,420</td>
<td>₹189,194</td>
<td>₹234,841</td>
<td>₹291,500</td>
</tr>
<tr>
<td>Equity Reinvestment Rate</td>
<td>80.50%</td>
<td>80.50%</td>
<td>80.50%</td>
<td>80.50%</td>
<td>80.50%</td>
<td>80.50%</td>
</tr>
<tr>
<td>Equity Reinvestment</td>
<td>₹79,632</td>
<td>₹98,845</td>
<td>₹122,693</td>
<td>₹152,295</td>
<td>₹189,039</td>
<td>₹234,648</td>
</tr>
<tr>
<td>FCFE</td>
<td>₹19,294</td>
<td>₹23,949</td>
<td>₹29,727</td>
<td>₹36,899</td>
<td>₹45,802</td>
<td>₹56,852</td>
</tr>
<tr>
<td>PV of FCFE@13.5%</td>
<td>₹21,100</td>
<td>₹23,075</td>
<td>₹25,235</td>
<td>₹27,597</td>
<td>₹30,180</td>
<td></td>
</tr>
</tbody>
</table>

Sum of PV of FCFE $= 127,187\text{₹}$
Stable growth and value....

- After year five, we will assume that the beta will increase to 1 and that the equity risk premium will decline to 6.98% percent (as the company becomes more global). The resulting cost of equity is 13.55 percent.
  
  Cost of Equity in Stable Growth = 6.57% + 1(6.98%) = 13.55%

- We will assume that the growth in net income will drop to 6% and that the return on equity will drop to 13.55% (which is also the cost of equity).
  
  Equity Reinvestment Rate in Stable Growth = 6%/13.55% = 44.28%
  
  FCFE in Year 6 = ₹291,500(1.06)(1 – 0.4428) = ₹ 136,822 million
  
  Terminal Value of Equity = ₹136,822/(0.1355 – 0.06) = ₹ 2,280,372 million

- To value equity in the firm today
  
  Value of equity = PV of FCFE during high growth + PV of terminal value
  
  = ₹127,187 + 2,280,372/1.1355 = ₹742,008 million

  Dividing by 2694.08 million shares yields a value of equity per share of ₹275.42, about 40% lower than the stock price of ₹427.85 per share.
Baidu: My valuation (November 2013)

### Term yr

<table>
<thead>
<tr>
<th>EBIT (1-t)</th>
<th>Reinv</th>
<th>FCFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>¥14,596</td>
<td>9.776</td>
<td>32,120</td>
</tr>
</tbody>
</table>

### Terminal Value

\[ \text{Terminal Value}_{10} = \frac{32,120}{.10-0.035} = ¥494,159 \]

### Cost of capital

\[ \text{Cost of capital} = 0.9477 \times 12.91\% + 0.0523 \times 3.45\% = 12.42\% \]

### Value/share

\[ \text{Value/share} = ¥150.33 \]

### Riskfree Rate

\[ \text{Riskfree Rate: Riskfree rate} = 3.5\% \]

### Beta

\[ \text{Beta} = 1.356 \]

### ERP

\[ \text{ERP} = 6.94\% \]

### Unlevered Beta for Businesses

\[ \text{Unlevered Beta} = 1.30 \]

### D/E

\[ \text{D/E} = 5.52\% \]

### Stable Growth

\[ g = 3.5\% \]

### Cost of capital decreases to

\[ 10\% \text{ from years 6-10} \]

### Reinvestment Rate

\[ \text{Reinvestment Rate} = 3.5\%/15\% = 23.33\% \]

### ROC

\[ \text{ROC} = 15\% \]

### Weights

\[ \text{E} = 94.77\% \]

\[ \text{D} = 5.23\% \]

In November 2013, the stock was trading at ¥160.06 per share.
<table>
<thead>
<tr>
<th></th>
<th><strong>High Growth Phase</strong></th>
<th><strong>Transition Phase</strong></th>
<th><strong>Stable Growth Phase</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of Period</strong></td>
<td>5 years</td>
<td>5 years</td>
<td>Forever after 10 years</td>
</tr>
<tr>
<td><strong>Tax Rate</strong></td>
<td>31.02% (Effective)</td>
<td>31.02% (Effective)</td>
<td>31.02% (Effective)</td>
</tr>
<tr>
<td></td>
<td>36.1% (Marginal)</td>
<td>36.1% (Marginal)</td>
<td>36.1% (Marginal)</td>
</tr>
<tr>
<td><strong>Return on Capital</strong></td>
<td>12.61%</td>
<td>Declines linearly to 10%</td>
<td>Stable ROC of 10%</td>
</tr>
<tr>
<td><strong>Reinvestment Rate</strong></td>
<td>53.93% (based on normalized acquisition costs)</td>
<td>Declines gradually to 25% as ROC and growth rates drop:</td>
<td>25% of after-tax operating income. Reinvestment rate = g/ ROC = 2.5/10=25%</td>
</tr>
<tr>
<td><strong>Expected Growth Rate in EBIT</strong></td>
<td>ROC * Reinvestment Rate = 0.1261*.5393 = .068 or 6.8%</td>
<td>Linear decline to Stable Growth Rate of 2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Debt/Capital Ratio</strong></td>
<td>11.5%</td>
<td>Rises linearly to 20.0%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Risk Parameters</strong></td>
<td>Beta = 1.0013, k_e = 8.52%% Pre-tax Cost of Debt = 3.75% Cost of capital = 7.81%</td>
<td>Beta changes to 1.00; Cost of debt stays at 3.75% Cost of capital declines gradually to 7.29%</td>
<td>Beta = 1.00; k_e = 8.51% Cost of debt stays at 3.75% Cost of capital = 7.29%</td>
</tr>
</tbody>
</table>
Disney - November 2013

**Current Cashflow to Firm**
- EBIT(1-t) = 10,032(1-.31) = 6,920
- (Cap Ex - Deprecn) = 3,629
- Chg Working capital = 103
- FCFF = 3,188

Reinvestment Rate = 3,732/6920 = 53.93%
Return on capital = 12.61%

**Reinvestment Rate** 53.93%
**Return on Capital** 12.61%

**Expected Growth**
0.5393 * 1.261 = 0.068 or 6.8%

First 5 years

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT *(1 - tax rate)</td>
<td>$7,391</td>
<td>$7,893</td>
<td>$8,430</td>
<td>$9,003</td>
<td>$9,615</td>
<td>$10,187</td>
<td>$10,704</td>
<td>$11,156</td>
<td>$11,531</td>
<td>$11,819</td>
</tr>
<tr>
<td>- Reinvestment</td>
<td>$3,985</td>
<td>$4,256</td>
<td>$4,546</td>
<td>$4,855</td>
<td>$5,185</td>
<td>$4,904</td>
<td>$4,534</td>
<td>$4,080</td>
<td>$3,550</td>
<td>$2,955</td>
</tr>
<tr>
<td>FCFF</td>
<td>$3,405</td>
<td>$3,637</td>
<td>$3,884</td>
<td>$4,148</td>
<td>$4,430</td>
<td>$5,283</td>
<td>$6,170</td>
<td>$7,076</td>
<td>$7,981</td>
<td>$8,864</td>
</tr>
</tbody>
</table>

Earnings Before Interest and Taxes (EBIT) Adjusted for Income Tax = $10,032(1-.31) = $6,920
- (Capital Expenditures - Depreciation) = $3,629
- Change in Working Capital = $103
- Free Cash Flow from Operations (FCFF) = $3,188

**Cost of Capital (WACC)** = 8.52% (0.885) + 2.40% (0.115) = 7.81%

**Stable Growth**
g = 2.5%; Beta = 1.00;
Debt %= 20%; k(debt) = 3.75
Cost of capital = 7.29%
Tax rate = 36.1%; ROC = 10%;
Reinvestment Rate = 2.5/10 = 25%

**Terminal Value** = 9,086/(0.0729 - 0.025) = 189,738

**Term Yr**
- 12,114
- 3,029
- 9,086

**Cost of Debt**
(2.75% + 1.00%)(1-.361) = 2.40%
Based on actual A rating

**Cost of Equity**
8.52%

**Riskfree Rate**
Riskfree rate = 2.75%

**Beta**
1.0013

**ERP for operations**
5.76%

**Unlevered Beta for Sectors**
0.9239

**D/E**
13.10%

In November 2013, Disney was trading at $67.71/share
**Cost of capital** = 8.52% (.885) + 2.4% (.115) = 7.81%

**Financing Choices**
Mostly US $ debt with duration of 6 years

**Reinvestment Rate**
53.93%

**Cost of capital** = 8.52% (.885) + 2.4% (.115) = 7.81%

**The Investment Decision**
Invest in projects that earn a return greater than a minimum acceptable hurdle rate

**The Dividend Decision**
If you cannot find investments that earn more than the hurdle rate, return the cash to the owners of the business.

**Existing Investments**
ROC = 12.61%

**New Investments**
Return on Capital = 12.61%

**Current EBIT (1-t)**
$6,920

**Expected Growth Rate**
12.61% * 53.93% = 6.8%

**Return on Capital**
12.61%

**The Financing Decision**
Choose a financing mix that minimizes the hurdle rate and match your financing to your assets.

**Financing Mix**
D=11.5%; E=88.5%

**Financing Choices**
Mostly US $ debt with duration of 6 years

---

**Strategic investments determine length of growth period**

<table>
<thead>
<tr>
<th>Year</th>
<th>Expected Growth</th>
<th>EBIT (1-t)</th>
<th>Reinvestment</th>
<th>FCFF</th>
<th>Terminal Value</th>
<th>Cost of capital</th>
<th>PV</th>
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<td>1</td>
<td>6.80%</td>
<td>$7,391</td>
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<td>$8,864</td>
<td>$189,738</td>
<td>7.29%</td>
<td>$94,966</td>
</tr>
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Value of operating assets of the firm = $125,477
Value of Cash & Non-operating assets = $6,780
Value of Firm = $132,257
Market Value of outstanding debt = $15,961
Minority Interests = $2,721
Market Value of Equity = $113,575
Value of Equity in Options = $972
Value of Equity in Common Stock = $112,603
Market Value of Equity/share = $62.56

**Disney: Corporate Financing Decisions and Firm Value**

Aswath Damodaran
Ways of changing value...

Cashflows from existing assets
Cashflows before debt payments, but after taxes and reinvestment to maintain existing assets

Are you investing optimally for future growth?

Growth from new investments
Growth created by making new investments; function of amount and quality of investments

Efficiency Growth
Growth generated by using existing assets better

Expected Growth during high growth period

Length of the high growth period
Since value creating growth requires excess returns, this is a function of
- Magnitude of competitive advantages
- Sustainability of competitive advantages

Cost of capital to apply to discounting cashflows
Determined by
- Operating risk of the company
- Default risk of the company
- Mix of debt and equity used in financing

Are you building on your competitive advantages?

Are you using the right amount and kind of debt for your firm?

Is there scope for more efficient utilization of existing assets?

Stable growth firm, with no or very limited excess returns

How well do you manage your existing investments/assets?

Are you investing optimally for future growth?

Aswath Damodaran
In November 2013, Disney was trading at $67.71/share.

Move to optimal debt ratio, with higher beta.
Maximize the value of the business (firm)

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

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

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

The hurdle rate should reflect the riskiness of the investment and the mix of debt and equity used to fund it.

The return should reflect the magnitude and the timing of the cashflows as well as all side effects.

The optimal mix of debt and equity maximizes firm value.

The right kind of debt matches the tenor of your assets.

How much cash you can return depends upon current & potential investment opportunities.

How you choose to return cash to the owners will depend on whether they prefer dividends or buybacks.

Aswath Damodaran