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

1. 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.

2. 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.

3. 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.
Intrinsic Value: Four Basic Propositions

The value of an asset is the present value of the expected cash flows on that asset, over its expected life:

\[
\text{Value of asset} = \frac{E(CF_1)}{(1 + r)} + \frac{E(CF_2)}{(1 + r)^2} + \frac{E(CF_3)}{(1 + r)^3} + \cdots + \frac{E(CF_n)}{(1 + r)^n}
\]

1. **The IT Proposition**: If “it” does not affect the cash flows or alter risk (thus changing discount rates), “it” cannot affect value.

2. **The DUH Proposition**: For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.

3. **The DON’T FREAK OUT Proposition**: Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.

4. **The VALUE IS NOT PRICE Proposition**: The value of an asset may be very different from its price.
DCF Choices: Equity Valuation versus Firm Valuation

**Firm Valuation:** Value the entire business

<table>
<thead>
<tr>
<th><strong>Assets</strong></th>
<th><strong>Liabilities</strong></th>
</tr>
</thead>
</table>
| Existing Investments  
Generate cashflows today  
Includes long lived (fixed) and short-lived (working capital) assets | Debt  
Fixed Claim on cash flows  
Little or No role in management  
*Fixed Maturity*  
*Tax Deductible* |
| Expected Value that will be created by future investments | Equity  
Residual Claim on cash flows  
Significant Role in management  
*Perpetual Lives* |

**Equity valuation:** Value just the equity claim in the business
The Set Up

The Numbers People
- Excel Ninjas
- Masters of Modeling
- Accounting Taskmasters

The Stories People
- Spinners of wondrous tales
- Creative geniuses

The Valuation Intermediary
- Can talk both languages
- Connect narratives to numbers
- Bring discipline to both sides
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

Present value is
a. Value of equity, if cashflows to equity discounted at cost of equity
b. Value of operating assets of the firm, if cashflows to firm discounted at the cost of capital
I. Estimating Cash Flows

Cash Flow used

Cash flow to equity

Free Cash flow to Firm
EBIT (1 - tax rate)
- (Cap Ex - Depreciation)
- Change in Working Capital

Free Cash flow to Equity
(Potential Dividend)
Net Income
- (Cap Ex - Depreciation)
- Change in Working Capital
- (Debt issued - Debt repaid)

Dividends
Augmented Dividends
Dividends + Stock Buybacks
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:

After-tax Operating Income = 10,032 \times (1 - 0.3102) = $6,920

- Net Cap Expenditures = $5,239 - $2,192 = $3,629
- Change in Working Capital = $103

Free Cashflow to Firm (FCFF) = $3,188

The reinvestment and reinvestment rate are as follows:

- Reinvestment = $3,629 + $103 = $3,732 million
- Reinvestment Rate = $3,732 / $6,920 = 53.93%

Aswath Damodaran
II. Discount Rates

- **Keep it current**: When doing a valuation, you need a discount rate that reflects today’s conditions. Not only does this require you to update the base risk free rate, but also your risk premiums (equity risk premium and default spread) and perhaps even your measures of risk (betas, default risk measures).

- **Keep it consistent**: At an intuitive level, the discount rate used should be consistent with both the riskiness and the type of cash flow 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.

- **Keep it in perspective**: The discount rate obviously matters in a discounted cash flow valuation, but not as much as your other inputs. In fact, as uncertainty about the future increases, the more you should focus on estimating cash flows and the less your should focus on discount rates.
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):

  \[
  \text{Cost of capital} = 8.52\% \frac{121,878}{(15,961+121,878)} + 2.40\% \frac{15,961}{(15,961+121,878)} = 7.81\%
  \]
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>
<td>7.81%</td>
</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>
</tr>
<tr>
<td>10</td>
<td>1.0000</td>
<td>8.51%</td>
<td>2.40%</td>
<td>20.00%</td>
<td>7.29%</td>
</tr>
</tbody>
</table>
III. Expected Growth

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
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.
  Expected Growth Rate from Existing Fundamentals = 53.93% * 12.61% = 6.8%

Aswath Damodaran
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:

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

- 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)
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%
## 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</td>
<td>Present value is value of equity per share</td>
</tr>
<tr>
<td>cost of equity</td>
<td></td>
</tr>
<tr>
<td>Discount aggregate FCFE at the cost</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>of equity</td>
<td></td>
</tr>
<tr>
<td>Discount aggregate FCFF at the cost</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>
<tr>
<td>of capital</td>
<td></td>
</tr>
</tbody>
</table>
## Disney: Inputs to Valuation

<table>
<thead>
<tr>
<th></th>
<th>High Growth Phase</th>
<th>Transition Phase</th>
<th>Stable Growth Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Period</td>
<td>5 years</td>
<td>5 years</td>
<td>Forever after 10 years</td>
</tr>
<tr>
<td>Tax Rate</td>
<td>31.02% (Effective) 36.1% (Marginal)</td>
<td>31.02% (Effective) 36.1% (Marginal)</td>
<td>31.02% (Effective) 36.1% (Marginal)</td>
</tr>
<tr>
<td>Return on Capital</td>
<td>12.61%</td>
<td>Declines linearly to 10%</td>
<td>Stable ROC of 10%</td>
</tr>
<tr>
<td>Reinvestment Rate</td>
<td>53.93% (based on normalized acquisition costs)</td>
<td>Declines gradually to 25% as ROC and growth rates drop: 25% of after-tax operating income. Reinvestment rate = $g/ROC = 2.5/10=25%$</td>
<td>25%</td>
</tr>
<tr>
<td>Expected Growth Rate in EBIT</td>
<td>$ROC \times Reinvestment Rate = 0.1261 \times 0.5393 = 0.068 \text{ or } 6.8%$</td>
<td>Linear decline to Stable Growth Rate of 2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Debt/Capital Ratio</td>
<td>11.5%</td>
<td>Rises linearly to 20.0%</td>
<td>20%</td>
</tr>
<tr>
<td>Risk Parameters</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>

Aswath Damodaran
Disney - November 2013

**Current Cashflow to Firm**

EBIT(1-t) = 10,032(1-.31) = 6,920
- (Cap Ex - Deprec) = 3,629
- Chg Working capital = 103
= FCFF = 3,188
Reinvestment Rate = 3,732/6920 = 53.93%
Return on capital = 12.61%

**Expected Growth**

Return on Capital = 12.61%
Reinvestment Rate = 53.93%

**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 = 25%

**Terminal Value**

Terminal Value\(_{10}\) = 9,086/(.0729-.025) = 189,738

**Cost of Capital (WACC)**

8.52% (0.885) + 2.40% (0.115) = 7.81%

**Cost of Debt**

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

**ERP for operations**

5.76%

**Weights**

E = 88.5% D = 11.5%

**Riskfree Rate**

Riskfree rate = 2.75%

**Beta**

1.0013

**Unlevered Beta for Sectors**

0.9239

**D/E**

13.10%

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

Disney: Corporate Financing Decisions and Firm Value
Ways of changing value...

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

**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

**Stable growth firm, with no or very limited excess returns**

- Are you investing optimally for future growth?
- How well do you manage your existing investments/assets?
- 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?
### Current Cashflow to Firm

\[
\text{EBIT}(1-t) = 10,032(1-.31) = 6,920 \\
\text{Cap Ex - Deprec} = 3,629 \\
\text{Chg Working capital} = 103 \\
\text{FCFF} = 3,188 \\
\text{Reinvestment Rate} = 3,732/6920 = 53.93% \\
\text{Return on capital} = 12.61%
\]

### Disney (Restructured) - November 2013

- **Expected Growth**
  
  \[ \text{Expected Growth} = 0.50 \times 0.14 = 0.07 \text{ or } 7\%
  \]

- **Return on Capital**
  
  14.00%

- **Reinvestment Rate**
  
  50.00%

- **More selective acquisitions & payoff from gaming**

### Stable Growth

- **g = 2.75%**
- **Beta = 1.20**
- **Debt % = 40%**
- **k(debt) = 3.75%**
- **Cost of capital = 6.76%**
- **Tax rate = 36.1%**
- **ROC = 10%**
- **Reinvestment Rate = 2.5/10 = 25%**

- **Terminal Value**
  
  \[ \text{Terminal Value}_{10} = \frac{9,206}{(0.0676 - 0.025)} = 216,262 \]

### First 5 years

<table>
<thead>
<tr>
<th>Year</th>
<th>EBIT * (1 - tax rate)</th>
<th>Reinvestment</th>
<th>Free Cashflow to Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$7,404</td>
<td>$3,702</td>
<td>$3,702</td>
</tr>
<tr>
<td>2</td>
<td>$7,923</td>
<td>$3,961</td>
<td>$3,961</td>
</tr>
<tr>
<td>3</td>
<td>$8,477</td>
<td>$4,239</td>
<td>$4,239</td>
</tr>
<tr>
<td>4</td>
<td>$9,071</td>
<td>$4,535</td>
<td>$4,535</td>
</tr>
<tr>
<td>5</td>
<td>$9,706</td>
<td>$4,853</td>
<td>$4,853</td>
</tr>
<tr>
<td>6</td>
<td>$10,298</td>
<td>$5,664</td>
<td>$5,664</td>
</tr>
<tr>
<td>7</td>
<td>$10,833</td>
<td>$6,500</td>
<td>$6,500</td>
</tr>
<tr>
<td>8</td>
<td>$11,299</td>
<td>$7,344</td>
<td>$7,344</td>
</tr>
<tr>
<td>9</td>
<td>$11,683</td>
<td>$8,178</td>
<td>$8,178</td>
</tr>
<tr>
<td>10</td>
<td>$11,975</td>
<td>$8,981</td>
<td>$8,981</td>
</tr>
</tbody>
</table>

### Cost of Capital (WACC)

\[ \text{Cost of Capital (WACC)} = 8.52\% \times 0.60 + 2.40\% \times 0.40 = 7.16\% \]

### In November 2013, Disney was trading at $67.71/share

- **Move to optimal debt ratio, with higher beta.**

### Answath Damodaran
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.

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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

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

- 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