THE CORPORATE LIFE CYCLE: GROWING UP IS HARD TO DO, GROWING OLD IS EVEN HARDER!

Aswath Damodaran
## The Financial Balance Sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value added by investments you expect the company to take into the future. This value rests on perceptions of the opportunities you see for the firm.</strong></td>
<td><strong>Equity investors get whatever is left over, after meeting the debt obligations.</strong></td>
</tr>
<tr>
<td><strong>Assets in Place</strong></td>
<td><strong>Debt</strong></td>
</tr>
<tr>
<td><strong>Growth Assets</strong></td>
<td><strong>Equity</strong></td>
</tr>
<tr>
<td><strong>Value of investments you expect the company to take into the future. This value rests on perceptions of the opportunities you see for the firm.</strong></td>
<td><strong>Equity investors get whatever is left over, after meeting the debt obligations.</strong></td>
</tr>
</tbody>
</table>
The Corporate Life Cycle

<table>
<thead>
<tr>
<th>Lifecycle stage</th>
<th>Start-up</th>
<th>Young Growth</th>
<th>High Growth</th>
<th>Mature Growth</th>
<th>Mature Stable</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Have an idea for a business that meets an unmet need in the market.</td>
<td>Create a business model that converts ideas into revenues</td>
<td>Build the business, looking for scaling benefits (moving to profitability)</td>
<td>Grow your business, with revenue growth &amp; higher margins</td>
<td>Defend your business from competitors &amp; find new markets</td>
<td>Scale down your business as market shrinks.</td>
</tr>
</tbody>
</table>
The determinants of the life cycle

The Corporate Life Cycle: Drivers and Determinants

**The Length/Value of the Harvest (Mature phase)**
1. Growth in overall market
2. Magnitude of competitive advantages
3. Sustainability of competitive advantages

**Speed of Ascendancy**
1. Growth in potential market
2. Ease of scaling up
3. Customer Inertia (Stickiness of existing product or service)

**The Decline**
1. Ease of entry into market
2. Access to capital
3. Investment needs
4. Time lag to market

**Failure Rate**
1. Ease of entry into market
2. Easy Access to capital
3. Investment needs
4. Time lag to market

**The End Game**
1. Ease of liquidation
2. Value of salvageable assets
Tech versus Non-tech life cycles

**Tech firm life cycle**

Tech companies don't have long "mature" periods, where they get to live off the fat, because disruption is always around the corner.

Tech companies are able to climb the growth ladder faster because their growth requires less investment and their products are more likely to be accepted quickly by consumers.

Tech companies also have more precipitous declines from grace, for the same reason that they climbed so fast, i.e., new companies rise faster to take their business.

**Non-tech firm life cycle**

Non-tech companies get longer "mature" period, where they get to milk their cash cows.

Non-tech companies take longer to grow, partly because they need more investment to grow and partly because consumer inertia (attachment to existing products) is more deeply set.

Non-tech companies decline over long periods and may even find ways to live on as smaller, more focused versions of their original selves.
The Dream of Reincarnation

- The dream of mature and declining companies is rebirth, i.e., the possibility that they can rediscover their youth, and become young, growth companies again.

- In every period, there are a few companies that seem to succeed at this venture, and the companies and their CEOs become legendary, with case studies written about them.
  - In some of these companies, it is a combination of great management, luck and timing that allow for this success.
  - In others, the change is cosmetic.

- There is an ecosystem that is built around these “success stories” that markets them to other aging companies.
CORPORATE FINANCE ACROSS
THE LIFE CYCLE

Act your (corporate) age..
The Big Picture

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.

Maximize the value of the business (firm)
The emphasis in corporate finance shifts.

<table>
<thead>
<tr>
<th>Lifecycle stage</th>
<th>Start-up</th>
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<th>Mature Growth</th>
<th>Mature Stable</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investing Policy</strong></td>
<td>New product development</td>
<td>Market testing and build up</td>
<td>Scale up production</td>
<td>Augment capacity + New Products</td>
<td>Maintain capacity + Acquisitions</td>
<td>Reduce capacity</td>
</tr>
<tr>
<td><strong>Financing Policy</strong></td>
<td>Equity funding, debt only if desperate</td>
<td>Equity, public market option</td>
<td>Equity mainly, with some debt capacity</td>
<td>Debt capacity increases</td>
<td>Debt capacity maximized</td>
<td>Debt scales down with firm</td>
</tr>
<tr>
<td><strong>Dividend Policy</strong></td>
<td>Cash burn, with equity infusions</td>
<td>Cash burn maximized</td>
<td>Beginnings of positive cash flows</td>
<td>Cash buildup, if not returned</td>
<td>Peak cash returns</td>
<td>Cash return from asset divestitures</td>
</tr>
</tbody>
</table>
The Cash Flows over the Life Cycle

<table>
<thead>
<tr>
<th>Growth stage</th>
<th>Stage 1: Start-up</th>
<th>Stage 2: Young Growth</th>
<th>Stage 3: High Growth</th>
<th>Stage 4: Mature Growth</th>
<th>Stage 5: Mature Stable</th>
<th>Stage 6: Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Profits</td>
<td>Large operating losses</td>
<td>Operating losses narrow</td>
<td>Operating profits turn positive</td>
<td>Operating profits grow quickly</td>
<td>Operating profits level off</td>
<td>Operating profits decline</td>
</tr>
<tr>
<td>Reinvestment</td>
<td>Very high</td>
<td>High</td>
<td>Remain large, but scale down as percent of firm</td>
<td>Decrease</td>
<td>Scale down further</td>
<td>Divestment</td>
</tr>
<tr>
<td>Free Cash Flow to Firm</td>
<td>Negative</td>
<td>Negative</td>
<td>Cross over to positive territory</td>
<td>Positive &amp; growing</td>
<td>Positive &amp; stable</td>
<td>Positive &amp; dropping</td>
</tr>
</tbody>
</table>

Revenues
Earnings
Time
With reality checks..

1. For young companies, cash burn is a feature, not a bug: With young companies, cash flows will be negative in the early years, requiring new equity to be raised and dilution.

2. As growth starts to ease and companies mature, cash balances will build up during the transition: When growth starts to ease, cash flows will rise faster than revenues/profits, and as companies take time to adjust, cash balances will balloon out.

3. Once companies adjust to being mature, there will be more cash returned to stockholders: Returning cash to stockholders is not a failure, but a consequence of success.
Companies, act your age!

- For many reasons, companies try to speed up or slow down aging
  - Young companies that borrow money to grow faster, invest without a purpose or with too much focus on short term profits or pay dividends.
  - Mature growth companies that act young and refuse to return cash.
  - Stable companies that try to be growth companies through acquisitions.
  - Declining companies that think they can reverse decline, with new management and a new business plan.

Companies that don’t “act their age” will destroy value.
NARRATIVE TO NUMBERS, ACROSS THE LIFE CYCLE

All story to mostly numbers..
Value = Story + Numbers

The Numbers People

Favored Tools
- Accounting statements
- Excel spreadsheets
- Statistical Measures
- Pricing Data

Illusions/Delusions
1. Precision: Data is precise
2. Objectivity: Data has no bias
3. Control: Data can control reality

The Narrative People

Favored Tools
- Anecdotes
- Experience (own or others)
- Behavioral evidence

Illusions/Delusions
1. Creativity cannot be quantified
2. If the story is good, the investment will be.
3. Experience is the best teacher

A Good Valuation
# Narrative versus Numbers

<table>
<thead>
<tr>
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<th>Mature Growth</th>
<th>Mature Stable</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative versus Numbers</strong></td>
<td>All Narrative</td>
<td>Mostly narrative</td>
<td>Narrative + Numbers</td>
<td>Numbers + Narrative</td>
<td>Mostly Numbers</td>
<td>All Numbers</td>
</tr>
<tr>
<td><strong>Narrative Drivers</strong></td>
<td>How big is the narrative?</td>
<td>How plausible is narrative?</td>
<td>How profitable is narrative?</td>
<td>How scalable is narrative?</td>
<td>How sustainable is narrative?</td>
<td>How happy is the ending?</td>
</tr>
<tr>
<td><strong>Narrative Differences</strong></td>
<td>Unconstrained &amp; Large differences</td>
<td>Constraints mount as numbers build up</td>
<td>Differences across investors narrow, as history deepens</td>
<td>Constrained &amp; Narrow differences</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With a young company, narrative is central, divergent and volatile.

- It is central because it is the only thing that you are offering investors, since you have no history.
- It is divergent because you can still offer widely different narratives, since it is early in the game.
- It is volatile, because the real world will deliver surprises that will require you to adjust your narrative.

As companies age, their narratives get narrower as their histories, size and culture start to become binding. The numbers often drive the narrative, rather than the other way around.
Step 1: Develop a narrative for the business that you are valuing
In the narrative, you tell your story about how you see the business evolving over time.

Step 2: Test the narrative to see if it is possible, plausible and probable
There are lots of possible narratives, not all of them are plausible and only a few of them are probable.

Step 3: Convert the narrative into drivers of value
Take the narrative apart and look at how you will bring it into valuation inputs starting with potential market size down to cash flows and risk. By the time you are done, each part of the narrative should have a place in your numbers and each number should be backed up by a portion of your story.

Step 4: Connect the drivers of value to a valuation
Create an intrinsic valuation model that connects the inputs to an end-value for the business.

Step 5: Keep the feedback loop open
Listen to people who know the business better than you do and use their suggestions to fine tune your narrative and perhaps even alter it. Work out the effects on value of alternative narratives for the company.
A Young Company: My Uber Narrative in June 2014

1. An urban car service business: I saw Uber primarily as a force in urban areas and only in the car service business.

2. Which would expand the business moderately (about 40% over ten years) by bringing in new users.

3. With local networking benefits: If Uber becomes large enough in any city, it will quickly become larger, but that will be of little help when it enters a new city.

4. Maintain its revenue sharing (20%) system due to strong competitive advantages (from being a first mover).

5. And its existing low-capital business model, with drivers as contractors and very little investment in infrastructure.

Aswath Damodaran
Uber in 2014: From Story to Inputs

**Total Market**

\[ \text{Market Share} = \frac{\text{Revenues (Sales)}}{\text{Operating Expenses}} = \frac{\text{Operating Income}}{- \text{Taxes}} = \frac{\text{After-tax Operating Income}}{- \text{Reinvestment}} = \frac{\text{After-tax Cash Flow}}{\text{For time value & risk}} \]

Uber is an urban car service company, competing against taxis & limos in urban areas, but it may expand demand for car service. The global taxi/limo business is $100 billion in 2013, growing at 6% a year.

Uber will have competitive advantages against traditional car companies & against newcomers in this business, but no global networking benefits. Target market share is 10%

Uber will maintain its current model of keeping 20% of car service payments, even in the face of competition, because of its first mover advantages. It will maintain its current low-infrastructure cost model, allowing it to earn high margins. Target pre-tax operating margin is 40%.

Uber has a low capital intensity model, since it does not own cars or other infrastructure, allowing it to maintain a high sales to capital ratio for the sector (5.00)

The company is young and still trying to establish a business model, leading to a high cost of capital (12%) up front. As it grows, it will become safer and its cost of capital will drop to 8%.

VALUE OF OPERATING ASSETS

Cash

Uber has cash & capital, but there is a chance of failure. 10% probability of failure.

Adjusted for operating risk with a discount rate and for failure with a probability of failure.
Uber in 2014: From Inputs to Value

**Uber: Intrinsic valuation - June 8, 2014 (in US $)**

- **Global taxi market is $100 billion currently, expected to grow 8% a year for next ten years.**
- **Uber’s operating expenses will amount to 60% of its revenues. (Operating margin=40%)**
- **Uber will pay a tax rate of 30% on its income, increasing to 40% over the next 10 years.**
- **Uber will generate $5 in incremental revenues for every dollar of incremental capital.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Overall market</th>
<th>Share of market (gross)</th>
<th>Revenues as percent of gross</th>
<th>Annual Revenue</th>
<th>Operating margin</th>
<th>Effective tax rate</th>
<th>After-tax operating income</th>
<th>Sales/Capital Ratio</th>
<th>Reinvestment</th>
<th>Free Cash Flow to the Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$106,000</td>
<td>3.63%</td>
<td>20.00%</td>
<td>$769</td>
<td>7.00%</td>
<td>31%</td>
<td>$37</td>
<td>5.00</td>
<td>$94</td>
<td>-$57</td>
</tr>
<tr>
<td>2</td>
<td>$112,360</td>
<td>5.22%</td>
<td>20.00%</td>
<td>$1,173</td>
<td>10.67%</td>
<td>32%</td>
<td>$85</td>
<td>5.00</td>
<td>$81</td>
<td>$4</td>
</tr>
<tr>
<td>3</td>
<td>$119,102</td>
<td>6.41%</td>
<td>20.00%</td>
<td>$1,528</td>
<td>14.33%</td>
<td>33%</td>
<td>$147</td>
<td>5.00</td>
<td>$71</td>
<td>$76</td>
</tr>
<tr>
<td>4</td>
<td>$126,248</td>
<td>7.31%</td>
<td>20.00%</td>
<td>$1,846</td>
<td>18.00%</td>
<td>34%</td>
<td>$219</td>
<td>5.00</td>
<td>$64</td>
<td>$156</td>
</tr>
<tr>
<td>5</td>
<td>$133,823</td>
<td>7.98%</td>
<td>20.00%</td>
<td>$2,137</td>
<td>21.67%</td>
<td>35%</td>
<td>$332</td>
<td>5.00</td>
<td>$58</td>
<td>$243</td>
</tr>
<tr>
<td>6</td>
<td>$141,852</td>
<td>8.49%</td>
<td>20.00%</td>
<td>$2,408</td>
<td>25.33%</td>
<td>36%</td>
<td>$463</td>
<td>5.00</td>
<td>$54</td>
<td>$336</td>
</tr>
<tr>
<td>7</td>
<td>$150,363</td>
<td>8.87%</td>
<td>20.00%</td>
<td>$2,666</td>
<td>29.00%</td>
<td>37%</td>
<td>$610</td>
<td>5.00</td>
<td>$52</td>
<td>$435</td>
</tr>
<tr>
<td>8</td>
<td>$159,385</td>
<td>9.15%</td>
<td>20.00%</td>
<td>$2,916</td>
<td>32.67%</td>
<td>38%</td>
<td>$773</td>
<td>5.00</td>
<td>$50</td>
<td>$541</td>
</tr>
<tr>
<td>9</td>
<td>$168,948</td>
<td>9.36%</td>
<td>20.00%</td>
<td>$3,163</td>
<td>36.33%</td>
<td>39%</td>
<td>$953</td>
<td>5.00</td>
<td>$49</td>
<td>$652</td>
</tr>
<tr>
<td>10</td>
<td>$179,085</td>
<td>10.00%</td>
<td>20.00%</td>
<td>$3,582</td>
<td>40.00%</td>
<td>40%</td>
<td>$1,149</td>
<td>5.00</td>
<td>$84</td>
<td>$776</td>
</tr>
</tbody>
</table>

**Stable Growth (after year 10)**
- Expected growth rate = 2.50%
- Cost of capital = 8%
- Return on capital = 25%
- Reinvestment Rate= 2.5%/25% = 10%

**Terminal Value_{10} = 793/(.08-.025) = $14,418**

**Value of operating assets = $6,595**

- Adjust for probability of failure (10%)
  - Expected value = $6,595 (0.9) = $5,935

**Cost of capital for first 5 years = Top decile of US companies = 12%**

**Cost of capital declines from 12% to 8% from years 6 to 10.**

Based on the investment of $1.2 billion made by investors, the imputed value for Uber's operating assets, in June 2014, was $17 billion.
Divergent Stories? Tesla Story Choices in 2016

The Tesla Story Choices

<table>
<thead>
<tr>
<th>Business</th>
<th>Focus</th>
<th>Competitive Edge</th>
<th>Investment intensity</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Clean Energy</td>
<td></td>
<td>2. Technology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Market
- Market Share

Revenues

Operating Profits

Operating Margin

Reinvestment & free cash flow

- Reinvestment

Cost of Capital & Failure Adjustment

Value of Tesla’s Operating Assets

Add cash, net out debt and equity options

Value of Tesla’s Equity
And how they translate to numbers

<table>
<thead>
<tr>
<th></th>
<th>Revenue in 2026 (in billions) with 9% margin</th>
<th>Revenue in 2026 (in billions) with 12% margin</th>
<th>Revenue in 2026 (in billions) with 15% margin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 60</td>
<td>$ 70</td>
<td>$ 80</td>
</tr>
<tr>
<td>High End</td>
<td>$ (60.34)</td>
<td>$ (63.30)</td>
<td>$ (66.29)</td>
</tr>
<tr>
<td></td>
<td>1.58 (Current)</td>
<td>$ (59.25)</td>
<td>$ 75.53</td>
</tr>
<tr>
<td></td>
<td>2.24 (Tech)</td>
<td>$ 102.40</td>
<td>$ 125.89</td>
</tr>
<tr>
<td></td>
<td>$ 60</td>
<td>$ 70</td>
<td>$ 80</td>
</tr>
<tr>
<td></td>
<td>$ 82.66</td>
<td>$ 102.11</td>
<td>$ 123.68</td>
</tr>
<tr>
<td></td>
<td>1.19 (Auto)</td>
<td>$ 130.65</td>
<td>$ 158.13</td>
</tr>
<tr>
<td></td>
<td>1.58 (Current)</td>
<td>$ 173.80</td>
<td>$ 208.49</td>
</tr>
<tr>
<td></td>
<td>2.24 (Tech)</td>
<td>$ 173.80</td>
<td>$ 208.49</td>
</tr>
</tbody>
</table>

Weaker competitive advantages

Higher profit margins

Stronger competitive advantages

My base case
As companies mature, their stories become bounded.

### Apple

#### The Story

Apple is a cash machine, deriving much of its cash and value from its iPhone franchise. Its large size will make it disruptive growth difficult and I expect the company to continue to churn out cash from its existing businesses, albeit with almost flat revenues and declining margins, as competition increases. In spite of its size, the company will continue to be riskier than average, because it has to reinvent itself every two years to survive. Finally, the tax rate paid by the company will gradually rise over time to a global average and trapped cash will be returned with a tax penalty.

#### The Assumptions

<table>
<thead>
<tr>
<th></th>
<th>Base year</th>
<th>Years 1-5</th>
<th>Years 6-10</th>
<th>After year 10</th>
<th>Link to story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues (a)</td>
<td>$218,118</td>
<td>1.50%</td>
<td>1.00%</td>
<td>1.00%</td>
<td>Mature company; size impedes growth</td>
</tr>
<tr>
<td>Operating margin (b)</td>
<td>29.18%</td>
<td>29.18%</td>
<td>25.00%</td>
<td>25.00%</td>
<td>Margins decrease with competition</td>
</tr>
<tr>
<td>Tax rate</td>
<td>26.01%</td>
<td>26.01%</td>
<td>30.00%</td>
<td>30.00%</td>
<td>Tax rate increases to global average</td>
</tr>
<tr>
<td>Reinvestment (c)</td>
<td>Sales to capital ratio: 1.60</td>
<td>RIR = 14.35%</td>
<td></td>
<td>Reinvest like electronics company</td>
<td></td>
</tr>
<tr>
<td>Return on capital (d)</td>
<td>-7189.38%</td>
<td>Marginal ROIC = -6.60%</td>
<td>6.97%</td>
<td>ROIC converges on cost of capital</td>
<td></td>
</tr>
<tr>
<td>Cost of capital (d)</td>
<td>9.09%</td>
<td>6.97%</td>
<td></td>
<td>6.97%</td>
<td>In the 75th risk percentile of US firms</td>
</tr>
</tbody>
</table>

#### The Cash Flows

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Operating Margin</th>
<th>EBIT</th>
<th>EBIT (1-t)</th>
<th>Reinvestment</th>
<th>FCFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$221,390</td>
<td>28.76%</td>
<td>$63,674</td>
<td>$47,113</td>
<td>2,045</td>
</tr>
<tr>
<td>2</td>
<td>$224,711</td>
<td>28.34%</td>
<td>$63,690</td>
<td>$47,125</td>
<td>2,076</td>
</tr>
<tr>
<td>3</td>
<td>$228,081</td>
<td>27.93%</td>
<td>$63,692</td>
<td>$47,127</td>
<td>2,107</td>
</tr>
<tr>
<td>4</td>
<td>$231,502</td>
<td>27.51%</td>
<td>$63,680</td>
<td>$47,118</td>
<td>2,138</td>
</tr>
<tr>
<td>5</td>
<td>$234,975</td>
<td>27.09%</td>
<td>$63,654</td>
<td>$47,098</td>
<td>2,170</td>
</tr>
<tr>
<td>6</td>
<td>$238,265</td>
<td>26.67%</td>
<td>$63,549</td>
<td>$46,513</td>
<td>2,056</td>
</tr>
<tr>
<td>7</td>
<td>$241,362</td>
<td>26.25%</td>
<td>$63,366</td>
<td>$45,874</td>
<td>1,936</td>
</tr>
<tr>
<td>8</td>
<td>$244,258</td>
<td>25.84%</td>
<td>$63,106</td>
<td>$45,182</td>
<td>1,810</td>
</tr>
<tr>
<td>9</td>
<td>$246,945</td>
<td>25.42%</td>
<td>$62,768</td>
<td>$44,439</td>
<td>1,679</td>
</tr>
<tr>
<td>10</td>
<td>$249,415</td>
<td>25.00%</td>
<td>$62,354</td>
<td>$43,648</td>
<td>1,543</td>
</tr>
<tr>
<td>Terminal year</td>
<td>$251,909</td>
<td>25.00%</td>
<td>$62,977</td>
<td>$44,084</td>
<td>6,325</td>
</tr>
</tbody>
</table>

#### The Value

| Terminal value | $632,483 |
| PV(Terminal value) | $281,080 |
| PV (CF over next 10 years) | $286,557 |
| Value of operating assets = 657,637 |
| Adjustment for distress | - |

- Debt & Minority Interests | $94,141 |
+ Cash & Other Non-operating assets | $215,090 |
| Value of equity | $688,586 |
- Value of equity options | $128 |
| Number of shares | 5,336.17 |
| Value per share | $129.02 |

Probability of failure = 0.00%

Stock was trading at = $130.27
And in decline, they can be depressing..

## JC Penney in 2016: Road to Nowhere?

### Declining business: Revenues expected to drop by 3% a year for next 5 years

<table>
<thead>
<tr>
<th>Base year</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>Revenue growth rate</td>
<td>-3.00%</td>
<td>-3.00%</td>
<td>-3.00%</td>
<td>-3.00%</td>
<td>-3.00%</td>
<td>-2.00%</td>
<td>-1.00%</td>
<td>0.00%</td>
<td>1.00%</td>
<td>2.00%</td>
</tr>
<tr>
<td>Revenues</td>
<td>$12,522</td>
<td>$12,146</td>
<td>$11,782</td>
<td>$11,428</td>
<td>$11,086</td>
<td>$10,753</td>
<td>$10,538</td>
<td>$10,433</td>
<td>$10,433</td>
<td>$10,537</td>
</tr>
<tr>
<td>EBIT (Operating) margin</td>
<td>1.32%</td>
<td>1.82%</td>
<td>2.31%</td>
<td>2.80%</td>
<td>3.29%</td>
<td>3.79%</td>
<td>4.28%</td>
<td>4.77%</td>
<td>5.26%</td>
<td>5.76%</td>
</tr>
<tr>
<td>EBIT (Operating income)</td>
<td>$166</td>
<td>$221</td>
<td>$272</td>
<td>$320</td>
<td>$365</td>
<td>$407</td>
<td>$451</td>
<td>$498</td>
<td>$549</td>
<td>$607</td>
</tr>
<tr>
<td>Tax rate</td>
<td>35.00%</td>
<td>35.00%</td>
<td>35.00%</td>
<td>35.00%</td>
<td>35.00%</td>
<td>35.00%</td>
<td>36.00%</td>
<td>37.00%</td>
<td>38.00%</td>
<td>39.00%</td>
</tr>
<tr>
<td>EBIT(1-t)</td>
<td>$108</td>
<td>$143</td>
<td>$177</td>
<td>$208</td>
<td>$237</td>
<td>$265</td>
<td>$289</td>
<td>$314</td>
<td>$341</td>
<td>$370</td>
</tr>
<tr>
<td>- Reinvestment</td>
<td>$ (188)</td>
<td>$ (182)</td>
<td>$ (177)</td>
<td>$ (171)</td>
<td>$ (166)</td>
<td>$ (108)</td>
<td>$ (53)</td>
<td>$ -</td>
<td>$ 52</td>
<td>$ 105</td>
</tr>
<tr>
<td>FCFF</td>
<td>$ 331</td>
<td>$ 359</td>
<td>$ 385</td>
<td>$ 409</td>
<td>$ 431</td>
<td>$ 396</td>
<td>$ 366</td>
<td>$ 341</td>
<td>$ 318</td>
<td>$ 298</td>
</tr>
<tr>
<td>Cost of capital</td>
<td>9.00%</td>
<td>9.00%</td>
<td>9.00%</td>
<td>9.00%</td>
<td>9.00%</td>
<td>8.80%</td>
<td>8.60%</td>
<td>8.40%</td>
<td>8.20%</td>
<td>8.00%</td>
</tr>
<tr>
<td>PV(FCFF)</td>
<td>$ 304</td>
<td>$ 302</td>
<td>$ 297</td>
<td>$ 290</td>
<td>$ 280</td>
<td>$ 237</td>
<td>$ 201</td>
<td>$ 173</td>
<td>$ 149</td>
<td>$ 129</td>
</tr>
</tbody>
</table>

### Margins improve gradually to median for US retail sector (6.25%)

### As stores shut down, cash released from real estate.

### The cost of capital is at 9%, higher because of high cost of debt.

### High debt load and poor earnings put survival at risk. Based on bond rating, 20% chance of failure and liquidation will bring in 50% of book value.
The Bottom Line for Investors

- To be a successful investor in early-stage businesses, you need to be a good judge of narrative.
  - Not only do you need to be able to find good stories to invest in, but you also have to be able to separate impossible stories (fairy tales) from plausible stories, and then providing support (financial or management) to make the plausible into the probable.
  - You will also get much bigger disagreements about value and story, across investors.

- To be a successful in mature businesses, you need to be able to use the numbers that the business has already produced to decide on a narrative that is right for it, and then invest in companies where (you believe) the market has a mistaken narrative.
PRICE VERSUS VALUE, ACROSS THE LIFE CYCLE
Price versus Value: The Set up

Drivers of intrinsic value
- Cashflows from existing assets
- Growth in cash flows
- Quality of Growth

Drivers of price
- Market moods & momentum
- Surface stories about fundamentals

THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Accounting Estimates
Valuation Estimates

INTRINSIC VALUE
Value

Price
PRICE
Multiples and Comparable Transactions

Market value of equity

Market value for the firm
Firm value = Market value of equity + Market value of debt

Market value of operating assets of firm
Enterprise value (EV) = Market value of equity + Market value of debt - Cash

Step 1: Pick a multiple

Numerator = What you are paying for the asset
Denominator = What you are getting in return

Step 2: Choose comparables

Narrow versus Broad sector/business
Similar market cap or all companies
Country, Region or Global
Other criteria, subjective & objective

Step 3: Tell a story

Risk
- Lower risk for higher value
- Higher risk for lower value

Growth
- Higher growth for higher value
- Lower growth for lower value

Quality of growth
- Higher barriers to entry/moats for higher value
- Lower barriers to entry for lower value

Revenues
a. Accounting revenues
b. Drivers
- # Customers
- # Subscribers
  = # units

Earnings
a. To Equity investors
- Net Income
- Earnings per share
b. To Firm
- Operating income (EBIT)

Cash flow
a. To Equity
- Net Income + Depreciation
- Free CF to Equity
b. To Firm
- EBIT + DA (EBITDA)
- Free CF to Firm

Book Value
a. Equity
= BV of equity
b. Firm
= BV of debt + BV of equity
c. Invested Capital
= BV of equity + BV of debt - Cash

Multiple = Numerator / Denominator

CHOOSE A MULTIPLE

PICK COMPARABLE FIRMS

SPIN/TELL YOUR STORY
Uncertainty and the Pricing Imperative

- As investors/analysts face more uncertainty about the future, they become less willing to grapple with it and make estimates for the future, a requirement for valuation.

- Instead, they choose to price companies/assets, thus anchoring what they are willing to pay to what others are paying for similar assets.

- Note that while this reaction is understandable, the uncertainty still remains.
  - You are in denial. Hiding from uncertainty does not make it go away.
  - You are letting the crowd, just as uncertain as you are, determine what you should pay.
The Evolution of Uncertainty

<table>
<thead>
<tr>
<th>Growth stage</th>
<th>Stage 1: Start-up</th>
<th>Stage 2: Young Growth</th>
<th>Stage 3: High Growth</th>
<th>Stage 4: Mature Growth</th>
<th>Stage 5: Mature Stable</th>
<th>Stage 6: Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty about</td>
<td>Does the idea have potential?</td>
<td>Is there a business model for the idea to be commercialized?</td>
<td>Will the business model generate profits?</td>
<td>Can the business be scaled up?</td>
<td>Can the business be defended?</td>
<td>Will management face reality?</td>
</tr>
<tr>
<td>Type &amp; Magnitude</td>
<td>High &amp; company specific</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low &amp; sector or macro driven</td>
</tr>
</tbody>
</table>
Valuing young companies

**Figure 3: Estimation Issues - Young and Start-up Companies**

Making judgments on revenues/profits difficult because you cannot draw on history. If you have no product/service, it is difficult to gauge market potential or profitability. The company's entire value lies in future growth but you have little to base your estimate on.

- **Cash flows from existing assets non-existent or negative.**
- **What are the cashflows from existing assets?**
  - Different claims on cash flows can affect value of equity at each stage.
  - What is the value of equity in the firm?
- **How risky are the cash flows from both existing assets and growth assets?**
  - Limited historical data on earnings, and no market prices for securities makes it difficult to assess risk.
- **What is the value added by growth assets?**
- **When will the firm become a mature firm, and what are the potential roadblocks?**
  - Will the firm make it through the gauntlet of market demand and competition? Even if it does, assessing when it will become mature is difficult because there is so little to go on.
# Twitter: Setting the table in October 2013

<table>
<thead>
<tr>
<th></th>
<th>Last 10K</th>
<th>Trailing 12 month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$316.93</td>
<td>$534.46</td>
</tr>
<tr>
<td>Operating Income</td>
<td>($77.06)</td>
<td>($134.91)</td>
</tr>
<tr>
<td>Adjusted Operating Income</td>
<td>$7.66</td>
<td></td>
</tr>
<tr>
<td>Invested Capital</td>
<td></td>
<td>$955.00</td>
</tr>
<tr>
<td>Adjusted Operating Margin</td>
<td></td>
<td>1.44%</td>
</tr>
<tr>
<td>Sales/ Invested Capital</td>
<td></td>
<td>$0.56</td>
</tr>
</tbody>
</table>
Twitter: Priming the Pump for Valuation

1. Make small revenues into big revenues

My estimate for 2023: Overall online advertising market will be close to $200 billion and Twitter will have about 5.7% ($11.5 billion)

2. Make losses into profits

My estimate for Twitter: Operating margin of 25% in year 10

3. Reinvest for growth

My estimate for Twitter: Sales/Capital will be 1.50 for next 10 years

Aswath Damodaran
### Twitter Pre-IPO Valuation: October 27, 2013

**Starting numbers**

<table>
<thead>
<tr>
<th></th>
<th>Last 10K</th>
<th>Trailing 12 month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$316.93</td>
<td>$534.46</td>
</tr>
<tr>
<td>Operating income</td>
<td>-$77.06</td>
<td>-$134.91</td>
</tr>
<tr>
<td>Adjusted Operating income</td>
<td>7.67</td>
<td></td>
</tr>
<tr>
<td>Invested Capital</td>
<td>$955.00</td>
<td></td>
</tr>
<tr>
<td>Adjusted Operating Margin</td>
<td>1.44%</td>
<td></td>
</tr>
<tr>
<td>Sales/ Invested Capital</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Interest expenses</td>
<td>$2.49</td>
<td>$5.30</td>
</tr>
</tbody>
</table>

**Revenue growth of 51.5% a year for 5 years, tapering down to 2.5% in year 10**

**Pre-tax operating margin increases to 25% over the next 10 years**

**Sales to capital ratio of 1.50 for incremental sales**

**Terminal Value**

\[
\text{Terminal Value}_{10} = \frac{1466}{0.08 - 0.025} = 26,657
\]

**Cost of capital**

\[
\text{Cost of capital} = 11.12\% \times 0.981 + 5.16\% \times 0.019 = 11.01\%
\]

**Cost of capital decreases to 8% from years 6-10**

**Weights**

\[
E = 98.1\% \quad D = 1.9\%
\]

**Riskfree Rate**

Riskfree rate = 2.5%

**Beta**

1.40

**Risk Premium**

6.15%

75% from US (5.75%) + 25% from rest of world (7.23%)

**D/E = 1.71%**

**Operating assets**

$9,705

**+ Cash**

321

**+ IPO Proceeds**

1295

**- Debt**

214

**Value of equity**

11,106

**- Options**

713

**Value in stock**

10,394

**/ # of shares**

582.46

**Value/share**

$17.84

**Terminal year (11)**

**EBIT (1-t)**

$1,852

- **Reinvestment**

$386

**FCFF**

$1,466

**Stable Growth**

\[
g = 2.5\%; \quad \text{Beta} = 1.00; \\
\text{ROC} = 12\%; \\
\text{Reinvestment Rate} = 2.5\% / 12\% = 20.83\%
\]
### Pricing Twitter: Start with the “comparables”

<table>
<thead>
<tr>
<th>Company</th>
<th>Market Cap</th>
<th>Enterprise value</th>
<th>Revenues</th>
<th>EBITDA</th>
<th>Net Income</th>
<th>Number of users (millions)</th>
<th>EV/User</th>
<th>EV/Revenue</th>
<th>EV/EBITDA</th>
<th>PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>$173,540.00</td>
<td>$160,090.00</td>
<td>$7,870.00</td>
<td>$3,930.00</td>
<td>$1,490.00</td>
<td>1230.00</td>
<td>$130.15</td>
<td>20.34</td>
<td>40.74</td>
<td>116.47</td>
</tr>
<tr>
<td>Linkedin</td>
<td>$23,530.00</td>
<td>$19,980.00</td>
<td>$1,530.00</td>
<td>$182.00</td>
<td>$27.00</td>
<td>277.00</td>
<td>$72.13</td>
<td>13.06</td>
<td>109.78</td>
<td>871.48</td>
</tr>
<tr>
<td>Pandora</td>
<td>$7,320.00</td>
<td>$7,150.00</td>
<td>$655.00</td>
<td>-$18.00</td>
<td>-$29.00</td>
<td>73.40</td>
<td>$97.41</td>
<td>10.92</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Groupon</td>
<td>$6,690.00</td>
<td>$5,880.00</td>
<td>$2,440.00</td>
<td>$125.00</td>
<td>-$95.00</td>
<td>43.00</td>
<td>$136.74</td>
<td>2.41</td>
<td>47.04</td>
<td>NA</td>
</tr>
<tr>
<td>Netflix</td>
<td>$25,900.00</td>
<td>$25,380.00</td>
<td>$4,370.00</td>
<td>$277.00</td>
<td>$112.00</td>
<td>44.00</td>
<td>$576.82</td>
<td>5.81</td>
<td>91.62</td>
<td>231.25</td>
</tr>
<tr>
<td>Yelp</td>
<td>$6,200.00</td>
<td>$5,790.00</td>
<td>$233.00</td>
<td>$2.40</td>
<td>-$10.00</td>
<td>120.00</td>
<td>$48.25</td>
<td>24.85</td>
<td>2412.50</td>
<td>NA</td>
</tr>
<tr>
<td>Open Table</td>
<td>$1,720.00</td>
<td>$1,500.00</td>
<td>$190.00</td>
<td>$63.00</td>
<td>$33.00</td>
<td>14.00</td>
<td>$107.14</td>
<td>7.89</td>
<td>23.81</td>
<td>52.12</td>
</tr>
<tr>
<td>Zynga</td>
<td>$4,200.00</td>
<td>$2,930.00</td>
<td>$873.00</td>
<td>$74.00</td>
<td>-$37.00</td>
<td>27.00</td>
<td>$108.52</td>
<td>3.36</td>
<td>39.59</td>
<td>NA</td>
</tr>
<tr>
<td>Zillow</td>
<td>$3,070.00</td>
<td>$2,860.00</td>
<td>$197.00</td>
<td>-$13.00</td>
<td>-$12.45</td>
<td>34.50</td>
<td>$82.90</td>
<td>14.52</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Trulia</td>
<td>$1,140.00</td>
<td>$1,120.00</td>
<td>$144.00</td>
<td>-$6.00</td>
<td>-$18.00</td>
<td>54.40</td>
<td>$20.59</td>
<td>7.78</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Tripadvisor</td>
<td>$13,510.00</td>
<td>$12,860.00</td>
<td>$945.00</td>
<td>$311.00</td>
<td>$205.00</td>
<td>260.00</td>
<td>$49.46</td>
<td>13.61</td>
<td>41.35</td>
<td>65.90</td>
</tr>
</tbody>
</table>

Average | $130.01  | 11.32 | 350.80 | 267.44 |
Median   | $97.41   | 10.92 | 44.20  | 116.47 |
Read the tea leaves: See what the market cares about

<table>
<thead>
<tr>
<th></th>
<th>Market Cap</th>
<th>Enterprise value</th>
<th>Revenues</th>
<th>EBITDA</th>
<th>Net Income</th>
<th>Number of users (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Cap</td>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprise value</td>
<td>0.9998</td>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>0.8933</td>
<td>0.8966</td>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBITDA</td>
<td>0.9709</td>
<td>0.9701</td>
<td>0.8869</td>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Income</td>
<td>0.8978</td>
<td>0.8971</td>
<td>0.8466</td>
<td>0.9716</td>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>Number of users (millions)</td>
<td>0.9812</td>
<td>0.9789</td>
<td>0.8053</td>
<td>0.9354</td>
<td>0.8453</td>
<td>1.</td>
</tr>
</tbody>
</table>

Twitter had 240 million users at the time of its IPO. What price would you attach to the company?

Aswath Damodaran
Use the “market metric” and “market price”

- The most important variable, in late 2013, in determining market value and price in this sector (social media, ill defined as that is) is the number of users that a company has.
- Looking at comparable firms, it looks like the market is paying about $100/user in valuing social media companies, with a premium for “predictable” revenues (subscriptions) and user intensity.
- Twitter has about 240 million users and can be valued based on the $100/user:
  - Enterprise value = 240 * 100 = $24 billion
# Pricing and Value: Across the Life Cycle

<table>
<thead>
<tr>
<th>Growth stage</th>
<th>Stage 1: Start-up</th>
<th>Stage 2: Young Growth</th>
<th>Stage 3: High Growth</th>
<th>Stage 4 &amp; 5: Mature Stable</th>
<th>Stage 6: Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Questions</strong></td>
<td>Is there a market for the product or service? How big is that market? Will you survive?</td>
<td>Do people use your product or service? How much do they like it?</td>
<td>Will people pay for the product or service? Can you scale up, i.e., grow as you get bigger?</td>
<td>Can you make money of the product and service and sustain profitability in the face of competition?</td>
<td>What will you get if you sell your assets? How do you plan to return cash flows to your investors?</td>
</tr>
<tr>
<td><strong>Pricing Metrics &amp; Measures</strong></td>
<td>Market size, Cash on hand, Access to capital</td>
<td>Number of users, User intensity (EV/User)</td>
<td>User engagement with model, Revenues (EV/Sales)</td>
<td>Earnings levels and growth (PE, EV/EBIT)</td>
<td>Cash flows, Payout &amp; Debt servicing (PBV, EV/EBITDA)</td>
</tr>
<tr>
<td><strong>Narrative vs Numbers</strong></td>
<td>Mostly or all narrative</td>
<td>More narrative than numbers</td>
<td>Mix of narrative &amp; numbers</td>
<td>More numbers than narrative</td>
<td>Mostly or all numbers</td>
</tr>
<tr>
<td><strong>Value Drivers</strong></td>
<td>Total market size, Market Share &amp; Target Margin</td>
<td>Revenue Growth (and its drivers)</td>
<td>Revenue Growth &amp; Reinvestment</td>
<td>Operating margins and Return on capital</td>
<td>Dividends/Cash Returns &amp; Debt ratios</td>
</tr>
<tr>
<td><strong>Dangers</strong></td>
<td>Macro delusions, where companies are collectively overpriced, given market size.</td>
<td>Value distractions, with focus on wrong revenue drivers.</td>
<td>Growth illusions, with failure to factor in the cost of growth.</td>
<td>Disruption Denial, with failure to see threats to sustainable profits.</td>
<td>Liquidation leakage, with unrealistic assumptions about what others will pay for liquidated assets.</td>
</tr>
<tr>
<td><strong>Transitions</strong></td>
<td>Potential to Product</td>
<td>Product to Revenues</td>
<td>Revenues to Profits</td>
<td>Profits to Cash flows</td>
<td></td>
</tr>
</tbody>
</table>
THE MANAGERS’ JOB, ACROSS THE LIFE CYCLE

Story Tellers, Business Builders and Managers
As companies age, the managerial imperative shifts.

- With young companies, you need dreamers & visionaries: Early in a company’s life, when all you have are ideas and no clear business plan, it is all about the narrative. Not surprisingly, the most successful managers/investors at this stage are people who are stronger on narrative.

- As companies age, you need pragmatists and builders: As companies age, the emphasis shifts to numbers, partly because more of the value is determined by the narrative that has actually unfolded and partly because there are more numbers to focus on. The most successful managers/investors become people who can work with and around those numbers.
And the focus changes.... And so does the right CEO for the company.
As emphasis shifts, managers can resist, adapt or move on

- As young start-ups succeed and start moving into the growth, the managers who were instrumental in their success have three choices:
  - Adapt and adjust their focus to include numbers, without giving up their narrative.
  - Stay completely focused on narrative and ignore numbers.
  - Hand over control of the operating details of the company to a numbers person while handling the narrative part.

- With investors, the transition is made easier by the existence of public markets. As companies go public, these investors can cash out and go back to their preferred habitat.
The challenge of shorter life cycles.

- When life cycles were long, stretching over decades, time and aging allowed for smoother transitions, since CEOs aged with their companies, and moved on.
- As life cycles shorten, managers are far more likely to find their companies changing under them so quickly that they can no longer adapt.
  - To be a long tenured CEO, you will either need to be versatile and/or be able to delegate the work that you cannot do to people you empower and trust.
  - If these transitions are not well managed, there will be far more turnover in top management and activist investing will flourish.
“Growing old is mandatory, Growing up is optional”