## Tesla: Summary 15-year DCF Analysis (DCF valuation as of mid-year 2013)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit Volume</th>
<th>% Growth</th>
<th>Automotive Revenue Per Unit ($)</th>
<th>% Growth</th>
<th>Automotive Sales</th>
<th>Development Service Sales</th>
<th>Total Sales</th>
<th>% Growth</th>
<th>EBITDA</th>
<th>% Margin</th>
<th>D&amp;A</th>
<th>% of Capex</th>
<th>EBIT</th>
<th>% Margin</th>
<th>Effective Rate</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2013</td>
<td>24,298</td>
<td>52%</td>
<td>93,403</td>
<td>-9%</td>
<td>2,462</td>
<td>36</td>
<td>2,478</td>
<td>36%</td>
<td>148</td>
<td>6.0%</td>
<td>103</td>
<td>41%</td>
<td>45</td>
<td>1.8%</td>
<td>6%</td>
<td>44</td>
</tr>
<tr>
<td>FY 2014</td>
<td>36,883</td>
<td>79%</td>
<td>85,342</td>
<td>-9%</td>
<td>3,321</td>
<td>40</td>
<td>3,361</td>
<td>66%</td>
<td>417</td>
<td>12.4%</td>
<td>158</td>
<td>79%</td>
<td>259</td>
<td>7.7%</td>
<td>2%</td>
<td>258</td>
</tr>
<tr>
<td>FY 2015</td>
<td>64,684</td>
<td>34%</td>
<td>83,432</td>
<td>-5%</td>
<td>5,613</td>
<td>42</td>
<td>5,655</td>
<td>25%</td>
<td>920</td>
<td>16.3%</td>
<td>172</td>
<td>65%</td>
<td>748</td>
<td>11.8%</td>
<td>4%</td>
<td>758</td>
</tr>
<tr>
<td>FY 2016</td>
<td>86,713</td>
<td>73%</td>
<td>78,932</td>
<td>-17%</td>
<td>7,051</td>
<td>44</td>
<td>7,095</td>
<td>42%</td>
<td>1,042</td>
<td>14.7%</td>
<td>203</td>
<td>62%</td>
<td>839</td>
<td>12.0%</td>
<td>6%</td>
<td>872</td>
</tr>
<tr>
<td>FY 2017</td>
<td>149,869</td>
<td>43%</td>
<td>65,465</td>
<td>-3%</td>
<td>10,025</td>
<td>46</td>
<td>10,072</td>
<td>27%</td>
<td>2,150</td>
<td>18.7%</td>
<td>301</td>
<td>69%</td>
<td>1,285</td>
<td>14.1%</td>
<td>4%</td>
<td>900</td>
</tr>
<tr>
<td>FY 2018</td>
<td>214,841</td>
<td>21%</td>
<td>58,258</td>
<td>-2%</td>
<td>12,720</td>
<td>49</td>
<td>12,768</td>
<td>22%</td>
<td>3,138</td>
<td>18.3%</td>
<td>353</td>
<td>86%</td>
<td>1,796</td>
<td>16.1%</td>
<td>1%</td>
<td>908</td>
</tr>
<tr>
<td>FY 2019</td>
<td>291,861</td>
<td>36%</td>
<td>55,553</td>
<td>-1%</td>
<td>16,685</td>
<td>54</td>
<td>16,766</td>
<td>19%</td>
<td>4,066</td>
<td>18.2%</td>
<td>606</td>
<td>79%</td>
<td>2,459</td>
<td>16.0%</td>
<td>0%</td>
<td>1080</td>
</tr>
<tr>
<td>FY 2020</td>
<td>384,747</td>
<td>21%</td>
<td>55,991</td>
<td>3%</td>
<td>21,565</td>
<td>59</td>
<td>21,764</td>
<td>18%</td>
<td>4,857</td>
<td>17.1%</td>
<td>696</td>
<td>75%</td>
<td>3,245</td>
<td>15.9%</td>
<td>0%</td>
<td>1303</td>
</tr>
<tr>
<td>FY 2021</td>
<td>466,559</td>
<td>32%</td>
<td>56,586</td>
<td>-1%</td>
<td>26,347</td>
<td>69</td>
<td>26,403</td>
<td>17%</td>
<td>5,723</td>
<td>17.0%</td>
<td>811</td>
<td>73%</td>
<td>4,172</td>
<td>15.6%</td>
<td>0%</td>
<td>1314</td>
</tr>
<tr>
<td>FY 2022</td>
<td>550,398</td>
<td>21%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2023</td>
<td>550,398</td>
<td>32%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2024</td>
<td>643,850</td>
<td>18%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2025</td>
<td>726,655</td>
<td>13%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2026</td>
<td>820,645</td>
<td>12%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2027</td>
<td>922,481</td>
<td>10%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
<tr>
<td>FY 2028</td>
<td>1,034,215</td>
<td>12%</td>
<td>56,969</td>
<td>-1%</td>
<td>31,357</td>
<td>74</td>
<td>31,416</td>
<td>15%</td>
<td>6,328</td>
<td>16.8%</td>
<td>938</td>
<td>76%</td>
<td>4,927</td>
<td>14.9%</td>
<td>0%</td>
<td>1317</td>
</tr>
</tbody>
</table>

### Notes:
- EBITDA: 12,099
- Sales: 68,059
- Net Debt (Cash): (260)
- Tesla Diluted Shares: 142

### Calculations:
- Multiples: 12.0 x EBITDA High, 8.0 x EBITDA Low
- Discount Rate: 13.0%
- FY Month of Valuation: March 2023
- Discount Rate Low: 9.0%
- Month of FY End: April 2023
Step 4: Connect your narrative to key drivers of value

The Uber narrative (June 2014)

- 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.

- Total Market

  \[ \times \]

  Market Share

  =

  Revenues (Sales)

  -

  Operating Expenses

  =

  Operating Income

  -

  Taxes

  =

  After-tax Operating Income

  -

  Reinvestment

  =

  After-tax Cash Flow

Adjusted for time value & risk

Adjusted for operating risk with a discount rate and for failure with a probability of failure.

VALUE OF OPERATING ASSETS

- Cash

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

Target market share is 10%

Uber will have competitive advantages against traditional car companies & against newcomers in this business, but no global networking benefits.

Target pre-tax operating margin is 40%.

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.

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%.

Adjusted for operating risk with a discount rate and for failure with a probability of failure.
Step 4: Value the company (Uber)

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

- Global taxi market is $100 billion currently, expected to grow 6% a year for next ten years.

- Uber will keep 20% of the gross cab receipts as its revenues.

- 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.

| Term yr | EBIT (1-2) | $881 | - Reinv | 88 | FCF | $793 |

| Overall market | $106,000 | $112,360 | $119,102 | $126,248 | $133,823 | $141,852 | $150,363 | $159,385 | $168,948 | $179,085 |

- Share of market (gross) = 3.63%
- Revenues as percent of gross = 20.00%
- Annual Revenue = $769
- Operating margin = 7.00%
- Operating Income = $54
- Effective tax rate = 31%
- After-tax operating income = $37
- Sales/Capital Ratio = 5.00
- - Reinvestment = $94
- Free Cash Flow to the Firm = -$57

Value of operating assets = $6,595

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

Discount back the cash flows (including terminal value) at the cumulated cost of capital.

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.

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/(.08-0.025) = $14,418

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.

Aswath Damodaran
Step 5: Keep the feedback loop

1. **Not just car service company:** Uber is a car company, not just a car service company, and there may be a day when consumers will subscribe to a Uber service, rather than own their own cars. It could also expand into logistics, i.e., moving and transportation businesses.

2. **Not just urban:** Uber can create new demands for car service in parts of the country where taxis are not used (suburbia, small towns).

3. **Global networking benefits:** By linking with technology and credit card companies, Uber can have global networking benefits.
Valuing Bill Gurley’s Uber narrative

<table>
<thead>
<tr>
<th></th>
<th>Uber (Gurley)</th>
<th>Uber (Gurley Mod)</th>
<th>Uber (Damodaran)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrative</td>
<td>Uber will expand the car service market substantially, bringing in mass transit users &amp; non-users from the suburbs into the market, and use its networking advantage to gain a dominant market share, while maintaining its revenue slice at 20%.</td>
<td>Uber will expand the car service market substantially, bringing in mass transit users &amp; non-users from the suburbs into the market, and use its networking advantage to gain a dominant market share, while cutting prices and margins (to 10%).</td>
<td>Uber will expand the car service market moderately, primarily in urban environments, and use its competitive advantages to get a significant but not dominant market share and maintain its revenue slice at 20%.</td>
</tr>
<tr>
<td>Total Market</td>
<td>$300 billion, growing at 3% a year</td>
<td>$300 billion, growing at 3% a year</td>
<td>$100 billion, growing at 6% a year</td>
</tr>
<tr>
<td>Market Share</td>
<td>40%</td>
<td>40%</td>
<td>10%</td>
</tr>
<tr>
<td>Uber's revenue slice</td>
<td>20%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Value for Uber</td>
<td>$53.4 billion + Option value of entering car ownership market ($10 billion+)</td>
<td>$28.7 billion + Option value of entering car ownership market ($6 billion+)</td>
<td>$5.9 billion + Option value of entering car ownership market ($2-3 billion)</td>
</tr>
</tbody>
</table>
### Different narratives, Different Numbers

<table>
<thead>
<tr>
<th>Total Market</th>
<th>Growth Effect</th>
<th>Network Effect</th>
<th>Competitive Advantages</th>
<th>Value of Uber</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2. All car service</td>
<td>B3. Increase market by 50%</td>
<td>C3. Strong local network effects</td>
<td>D3. Semi-strong</td>
<td>$4,764</td>
</tr>
<tr>
<td>A4. Mobility Services</td>
<td>B1. None</td>
<td>C1. No network effects</td>
<td>D1. None</td>
<td>$1,888</td>
</tr>
<tr>
<td>A3. Logistics</td>
<td>B1. None</td>
<td>C1. No network effects</td>
<td>D1. None</td>
<td>$1,417</td>
</tr>
<tr>
<td>A2. All car service</td>
<td>B1. None</td>
<td>C1. No network effects</td>
<td>D1. None</td>
<td>$1,094</td>
</tr>
</tbody>
</table>
Step 6: Be ready to modify narrative as events unfold

<table>
<thead>
<tr>
<th>Narrative Break/End</th>
<th>Narrative Shift</th>
<th>Narrative Change (Expansion or Contraction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events, external (legal, political or economic) or internal (management, competitive, default), that can cause the narrative to break or end.</td>
<td>Improvement or deterioration in initial business model, changing market size, market share and/or profitability.</td>
<td>Unexpected entry/success in a new market or unexpected exit/failure in an existing market.</td>
</tr>
<tr>
<td>Your valuation estimates (cash flows, risk, growth &amp; value) are no longer operative</td>
<td>Your valuation estimates will have to be modified to reflect the new data about the company.</td>
<td>Valuation estimates have to be redone with new overall market potential and characteristics.</td>
</tr>
<tr>
<td>Estimate a probability that it will occur &amp; consequences</td>
<td>Monte Carlo simulations or scenario analysis</td>
<td>Real Options</td>
</tr>
</tbody>
</table>
Let the games begin... Time to value companies..

Let’s have some fun!
Equity Risk Premiums in Valuation

- The equity risk premiums that I have used in the valuations that follow reflect my thinking (and how it has evolved) on the issue.
  - Pre-1998 valuations: In the valuations prior to 1998, I use a risk premium of 5.5% for mature markets (close to both the historical and the implied premiums then).
  - Between 1998 and Sept 2008: In the valuations between 1998 and September 2008, I used a risk premium of 4% for mature markets, reflecting my belief that risk premiums in mature markets do not change much and revert back to historical norms (at least for implied premiums).
  - Valuations done in 2009: After the 2008 crisis and the jump in equity risk premiums to 6.43% in January 2008, I have used a higher equity risk premium (5-6%) for the next 5 years and will assume a reversion back to historical norms (4%) only after year 5.
  - After 2009: In 2010, I reverted back to a mature market premium of 4.5%, reflecting the drop in equity risk premiums during 2009. In 2011, I used 5%, reflecting again the change in implied premium over the year. In 2012 and 2013, stayed with 6%, reverted to 5% in 2014 and will be using 5.75% in 2015.
The Valuation Set up

- With each company that I value in this next section, I will try to start with a story about the company and use that story to construct a valuation.

- With each valuation, rather than focus on all of the details (which will follow the blueprint already laid out), I will focus on a specific component of the valuation that is unique or different.
Training Wheels On?

Stocks that look like Bonds, Things Change and Market Valuations
Training Wheels valuation: Con Ed in August 2008

**Value per share today**: Expected Dividends per share next year / (Cost of equity - Growth rate)

\[
\frac{2.32 (1.021)}{(0.077 - 0.021)} = 42.30
\]

Growth rate forever = 2.1%

**Cost of Equity** = 4.1% + 0.8 (4.5%) = 7.70%

Riskfree rate 4.10%
10-year T.Bond rate

Beta 0.80
Beta for regulated power utilities

Equity Risk Premium 4.5%
Implied Equity Risk Premium - US market in 8/2008

On August 12, 2008 Con Ed was trading at $40.76.

Test 1: Is the firm paying dividends like a stable growth firm?
Dividend payout ratio is 73%
In trailing 12 months, through June 2008
Earnings per share = $3.17
Dividends per share = $2.32

Test 2: Is the stable growth rate consistent with fundamentals?
Retention Ratio = 27%
ROE = Cost of equity = 7.7%
Expected growth = 2.1%

Test 3: Is the firm’s risk and cost of equity consistent with a stable growth firm?
Beta of 0.80 is at lower end of the range of stable company betas: 0.8 - 1.2

Why a stable growth dividend discount model?
1. **Why stable growth**: Company is a regulated utility, restricted from investing in new growth markets. Growth is constrained by the fact that the population (and power needs) of its customers in New York are growing at very low rates.
   Growth rate forever = 2%
2. **Why equity**: Company’s debt ratio has been stable at about 70% equity, 30% debt for decades.
3. **Why dividends**: Company has paid out about 97% of its FCFE as dividends over the last five years.
A break even growth rate to get to market price...

Con Ed: Value versus Growth Rate

Break even point: Value = Price

Value per share vs. Expected Growth Rate

Aswath Damodaran
From DCF value to target price and returns...

- Assume that you believe that your valuation of Con Ed ($42.30) is a fair estimate of the value, 7.70% is a reasonable estimate of Con Ed’s cost of equity and that your expected dividends for next year (2.32*1.021) is a fair estimate, what is the expected stock price a year from now (assuming that the market corrects its mistake?)

- If you bought the stock today at $40.76, what return can you expect to make over the next year (assuming again that the market corrects its mistake)?
### 3M: A Pre-crisis valuation

**Current Cashflow to Firm**
- \( \text{EBIT}(1-t) = 5344 \times (1 - 0.35) = 3474 \)
- \( - \text{Net Operating Capital} = 350 \)
- \( - \text{Change in Working Capital} = 691 \)
- \( = \text{FCFF} = 2433 \)

Reinvestment Rate = \( 1041 / 3474 = 29.97\% \)

Return on capital = 25.19%

**Expected Growth in EBIT (1-t)**
- \( 0.30 \times 0.25 = 0.075 \)
  \( 7.5\% \)

**Stable Growth**
- \( g = 3\% \)
- \( \text{Beta} = 1.10 \)
- \( \text{Debt Ratio} = 20\% \)
- \( \text{Tax rate} = 35\% \)
- \( \text{Cost of capital} = 6.76\% \)

Reinvestment Rate = \( \frac{3}{6.76} = 44\% \)

**Terminal Value**
- \( \frac{5}{0.0676 - 0.03} = 70,409 \)

**Cost of Equity**
- Riskfree Rate = 3.72%
  \( + \) Beta = 1.15
  \( \times \) Risk Premium = 4%

**Unlevered Beta for Sectors** = 1.09

**Weights**
- \( E = 92\% \)
- \( D = 8\% \)

**Op. Assets** = 60607
+ Cash: 3253
- Debt: 4920
= Equity: 58400

Value/Share $83.55

Cost of capital = 8.32% (0.92) + 2.91% (0.08) = 7.88%

**First 5 years**

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT (1-t)</td>
<td>$3,734</td>
<td>$4,014</td>
<td>$4,279</td>
<td>$4,485</td>
<td>$4,619</td>
</tr>
<tr>
<td>- Reinvestment</td>
<td>$1,120</td>
<td>$1,204</td>
<td>$1,312</td>
<td>$1,435</td>
<td>$1,540</td>
</tr>
<tr>
<td>= FCFF</td>
<td>$2,614</td>
<td>$2,810</td>
<td>$2,967</td>
<td>$3,049</td>
<td>$3,079</td>
</tr>
</tbody>
</table>

Cost of Debt
- \( (3.72\% + 0.75\%)(1 - 0.35) = 2.91\% \)

Riskfree Rate: Riskfree rate = 3.72%

On September 12, 2008, 3M was trading at $70/share.
3M: Post-crisis valuation

Current Cashflow to Firm

\[
\text{EBIT}(1-t) = 4810 (1 - 0.35) = 3180 \\
\text{Nt CpX} = 350 \\
- \text{Chg WC} = 691 \\
= \text{FCFF} = 2139 \\
\text{Reinvestment Rate} = 1041/3180 = 33\% \\
\text{Return on capital} = 23.06\% \\
\]

Expected Growth in EBIT \( (1-t) \)

\[
0.25 \times 0.20 = 0.05 \\
5\% \\
\]

Return on Capital 20\%

Return on capital = 23.06\%

Stable Growth

\( g = 3\%; \ \text{Beta} = 1.00;; \ \text{ERP} = 4\% \)

Cost of capital = 7.55\% 

Reinvestment Rate = 3/7.55 = 40\%

Terminal Value

\[
5 \times 2434/(0.0755 - 0.03) = 53,481 \\
\]

On October 16, 2008, MMM was trading at $57/share.

Cost of capital = 10.86\% (0.92) + 3.55\% (0.08) = 10.27\% 

Cost of Equity 10.86\%

Riskfree Rate: Riskfree rate = 3.96\%

Cost of Debt

\[
(3.96\% + 1.5\%)(1 - 0.35) = 3.55\% \\
\]

Weights

E = 92\% D = 8\%

Increased risk premium to 6\% for next 5 years

Unlevered Beta for Sectors: 1.09

Higher default spread for next 5 years

Cost of Debt

\[
(3.96\% + 1.5\%)(1 - 0.35) = 3.55\% \\
\]

Increase in Beta

\[
1.15 \\
\]

Risk Premium 6\%

Weightings

E = 92\% D = 8\%

First 5 years

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT (1-t)</td>
<td>$3,339</td>
<td>$3,506</td>
<td>$3,667</td>
<td>$3,807</td>
<td>$3,921</td>
</tr>
<tr>
<td>- Reinvestment</td>
<td>$835</td>
<td>$877</td>
<td>$1,025</td>
<td>$1,288</td>
<td>$1,558</td>
</tr>
<tr>
<td>= FCFF</td>
<td>$2,504</td>
<td>$2,630</td>
<td>$2,642</td>
<td>$2,519</td>
<td>$2,363</td>
</tr>
</tbody>
</table>

Terminal Value = 2434/(0.0755 - 0.03) = 53,481
From a Company to the Market: Valuing the S&P 500: Dividend Discount Model in January 2015

Rationale for model
Why dividends? Because it is the only tangible cash flow, right?
Why 2-stage? Because the expected growth rate in near term is higher than stable growth rate.

Dividends
$ Dividends in trailing 12 months = 38.57

Expected Growth
Analyst estimate for growth over next 5 years = 5.58%

Terminal Value = DPS in year 6 / (r-g)
= (50.59*1.0217) / (.0728-.0217) = 1010.91

Risk Premium
5.11%
Set at the average ERP over the last decade

Beta
1.00

Riskfree Rate
Treasury bond rate
2.17%

Cost of Equity
2.17% + 1.00 (5.11%) = 7.28%

On January 1, 2015, the S&P 500 index was trading at 2058.90.

Value of Equity per share = PV of Dividends & Terminal value at 7.94% = 895.14

Discount at Cost of Equity

S&P 500 is a good reflection of overall market
**From a Company to the Market: Valuing the S&P 500: Augmented Dividend Discount Model in January 2015**

**Rationale for model**
Why augmented dividends? Because companies are increasing returning cash in the form of stock buybacks
Why 2-stage? Because the expected growth rate in near term is higher than stable growth rate.

**Dividends**
$ Dividends +$ Buybacks in trailing 12 months = 100.50

**Expected Growth**
Analyst estimate for growth over next 5 years = 5.58%

**g = Riskfree rate = 2.17%**
Assume that earnings on the index will grow at same rate as economy.

**Terminal Value = Augmented Dividends in year 6 / (r-g)**
= (131.81*1.0217)/(.0728-.0217) = 2633.97

**Value of Equity per share = PV of Dividends & Terminal value at 7.28% = 2332.34**

**Discount at Cost of Equity**
Cost of Equity
2.17% + 1.00 (5.11%) = 7.28%

**Rational for model**

**Why augmented dividends?** Because companies are increasing returning cash in the form of stock buybacks

**Why 2-stage?** Because the expected growth rate in near term is higher than stable growth rate.

On January 1, 2015, the S&P 500 index was trading at 2058.90
Valuing the S&P 500: Augmented Dividends and Fundamental Growth January 2015

Rationale for model
Why augmented dividends? Because companies are increasing returning cash in the form of stock buybacks
Why 2-stage? Why not?

Dividends
$ Dividends + $ Buybacks in trailing 12 months = 100.50

ROE = 16.03%
Retention Ratio = 12.42%

Expected Growth
ROE * Retention Ratio = .1603*.1242 = 1.99%

g = Riskfree rate = 2.17%
Assume that earnings on the index will grow at same rate as economy.

Terminal Value= Augmented Dividends in year 6/ (r-g)
= (110.90*1.0217)/(.0728-.0217) = 2216.06

Value of Equity per share = PV of Dividends & Terminal value at 7.28% = 1992.11

Discount at Cost of Equity

Cost of Equity
2.17% + 1.00 (5.11%) = 7.28%

Riskfree Rate:
Treasury bond rate 2.17%

Beta
1.00

Risk Premium
5.11%
Set at the average ERP over the last decade

S&P 500 is a good reflection of overall market

On January 1, 2015, the S&P 500 index was trading at 2058.90