PRICE AND VALUE: WHAT’S YOUR GAME?

February 2014
Aswath Damodaran
Test 1: Are you pricing or valuing?
Test 2: Are you pricing or valuing?

Aswath Damodaran
Test 3: Are you pricing or valuing?

Rating
Buy
Europe
Switzerland
Biotechnology
Biotechnology

Company
BB BIOTECH

Date
13 August 2013

Strong sector and stock-picking continue

Impressive performance
Over the past two years, BB Biotech shares have roughly tripled, which could tempt investors to take profits. However, this performance has been well backed by a deserved revival of the biotech industry, encouraging fundamental news, M&A, and increased money flow into health care stocks. In addition, BB returned to index outperformance by modifying its stock-picking approach. Hence, despite excellent performance, the shares still trade at a 23% discount to the net asset value of the portfolio. Hence, the shares are an attractive value vehicle to capture growth opportunities in an attractive sector.

Biotech industry remains attractive
With the re-rating of the pharma sector, investors have also showed increased interest in biotech stocks. Established biotech stocks have delivered encouraging financial results and approvals, while there has also been substantial industry consolidation, which is not surprising in times of “cheap” money and high liquidity. BB Biotech remains an attractive vehicle to capture the future potential of the biotech sector. In addition, investors benefit from a 23% discount to NAV and attractive cash distribution policy of 5% yield p.a. Hence, we reiterate our Buy on BB Biotech shares.

BB Biotech shares remain attractive
In the first 6M of 2013, BB Biotech increased its NAV by 36%, which marks good outperformance against the Nasdaq Biotech Index (NBI)’s 27%. This is a remarkable performance after 2012, when BB’s NAV increase of 45% also
Test 4: Are you pricing or valuing?

A Venture Capital “Valuation”

Today

Young software company
Revenues = $2 m
Earnings (Loss) = -$1 m

Exit Year (Year 3)

Estimated revenues = $50 m
Estimated earnings = $10 million
Exit Earnings Multiple = 20
Estimated Exit Value = $10 \times 20 = $200 m

Value today
= \frac{200}{1.5^3}
= $59.26 m

Discount back at target rate of return on 50%
### Test 5: Are you pricing or valuing?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EBITDA</strong></td>
<td>$100.00</td>
<td>$120.00</td>
<td>$144.00</td>
<td>$172.80</td>
<td>$207.36</td>
</tr>
<tr>
<td><strong>- Depreciation</strong></td>
<td>$20.00</td>
<td>$24.00</td>
<td>$28.80</td>
<td>$34.56</td>
<td>$41.47</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>$80.00</td>
<td>$96.00</td>
<td>$115.20</td>
<td>$138.24</td>
<td>$165.89</td>
</tr>
<tr>
<td><strong>- Taxes</strong></td>
<td>$24.00</td>
<td>$28.80</td>
<td>$34.56</td>
<td>$41.47</td>
<td>$49.77</td>
</tr>
<tr>
<td><strong>EBIT (1-t)</strong></td>
<td>$56.00</td>
<td>$67.20</td>
<td>$80.64</td>
<td>$96.77</td>
<td>$116.12</td>
</tr>
<tr>
<td><strong>+ Depreciation</strong></td>
<td>$20.00</td>
<td>$24.00</td>
<td>$28.80</td>
<td>$34.56</td>
<td>$41.47</td>
</tr>
<tr>
<td><strong>- Cap Ex</strong></td>
<td>$50.00</td>
<td>$60.00</td>
<td>$72.00</td>
<td>$86.40</td>
<td>$103.68</td>
</tr>
<tr>
<td><strong>- Chg in WC</strong></td>
<td>$10.00</td>
<td>$12.00</td>
<td>$14.40</td>
<td>$17.28</td>
<td>$20.74</td>
</tr>
<tr>
<td><strong>FCFF</strong></td>
<td>$16.00</td>
<td>$19.20</td>
<td>$23.04</td>
<td>$27.65</td>
<td>$33.18</td>
</tr>
<tr>
<td><strong>Terminal Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$1,658.88</td>
</tr>
<tr>
<td><strong>Cost of capital</strong></td>
<td>8.25%</td>
<td>8.25%</td>
<td>8.25%</td>
<td>8.25%</td>
<td>8.25%</td>
</tr>
<tr>
<td><strong>Present Value</strong></td>
<td>$14.78</td>
<td>$16.38</td>
<td>$18.16</td>
<td>$20.14</td>
<td>$1,138.35</td>
</tr>
<tr>
<td><strong>Value of operating assets today</strong></td>
<td>$1,207.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>+ Cash</strong></td>
<td>$125.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>- Debt</strong></td>
<td>$200.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value of equity</strong></td>
<td>$1,132.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Test 6: Are you pricing or valuing?

- You are an accountant, given the onerous and massive responsibility of restating the assets on a balance sheet to “fair value”.

- In FAS 157, here is what it says: “The exchange price is the price in an orderly transaction between market participants to sell the asset or transfer ... The transaction to sell the asset or transfer the liability is a hypothetical transaction at the measurement date, considered from the perspective of a market participant that holds the asset or owes the liability. Therefore, the definition focuses on the price that would be received to sell the asset or paid to transfer the liability (an exit price), not the price that would be paid to acquire the asset or received to assume the liability (an entry price).”
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

Accounting Estimates

Valuation Estimates

INTRINSIC VALUE

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

PRICE
Intrinsic value is simple: We choose to make it complex

For cash flow generating assets, the intrinsic value will be a function of the magnitude of the expected cash flows on the asset over its lifetime and the uncertainty about receiving those cash flows.

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.
The determinants of value

What are the cashflows from existing assets?
- Equity: Cashflows after debt payments
- Firm: Cashflows before debt payments

What is the value added by growth assets?
Equity: Growth in equity earnings/cashflows
Firm: Growth in operating earnings/cashflows

How risky are the cash flows from both existing assets and growth assets?
Equity: Risk in equity in the company
Firm: Risk in the firm’s operations

When will the firm become a mature firm, and what are the potential roadblocks?
DCF as a tool for intrinsic valuation

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

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.

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.

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.

Value of asset = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} + \ldots + \frac{E(CF_n)}{(1+r)^n}
# 1. Cash Flows

<table>
<thead>
<tr>
<th>To get to cash flow</th>
<th>Here is why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Earnings</td>
<td>This is the earnings before interest &amp; taxes you generate from your existing assets. Operating Earnings = Revenues * Operating Margin. Measures the operating efficiency of your assets &amp; can be grown either by growing revenues and/or improving margins.</td>
</tr>
<tr>
<td>(minus) Taxes</td>
<td>These are the taxes you would pay on your operating income and are a function of the tax code under which you operate &amp; your fidelity to that code.</td>
</tr>
<tr>
<td>(minus) Reinvestment</td>
<td>Reinvestment is designed to generate future growth and can be in long term and short term assets. Higher growth usually requires more reinvestment, and the efficiency of growth is a function of how much growth you can get for your reinvestment.</td>
</tr>
<tr>
<td>Free Cash Flow to the Firm</td>
<td>This is a pre-debt cash flow that will be shared by lenders (as interest &amp; principal payments) and by equity investors (as dividends &amp; buybacks).</td>
</tr>
</tbody>
</table>
2. Discount Rates

Expected Return on a Risky Investment = Cost of Equity

\[
\text{Risk free Rate} + \text{Beta} \times \text{Equity Risk Premium} = \text{Expected Return on a Risky Investment}
\]

- **Risk free Rate**: Rate of return on a long term, default free bond. Will vary across currencies and across time.
- **Beta**: Relative measure of risk added to a diversified portfolio. Determined by the business or businesses that you operate it, with more exposure to macro economic risk translating into a higher beta.
- **Equity Risk Premium**: Premium investors demand over and above the risk free rate for investing in equities as a class. Function of the countries that you do business in and how much value you derive from each country.
Quality growth is rare requires that a firm be able to reinvest a lot and reinvest well (earnings more than your cost of capital) at the same time.

The larger you get, the more difficult it becomes to maintain quality growth.

You can grow while destroying value at the same time.
And its value

ROIC versus Cost of Capital: A Global Assessment for 2013

Of the 33,968 firms that had data available for ROC an cost of capital, 58.8% earned less than their cost of capital in 2013.

- ROC more than 5% below cost of capital
- ROC between 2% and 5% below cost of capital
- ROC between 2% and 0% below cost of capital
- ROC between 0 and 2% more than cost of capital
- ROC between 2% and 5% above cost of capital
- ROC more than 5% above cost of capital

Aswath Damodaran
4. The Terminal Value

Terminal Value \(_n = \frac{\text{EBIT}_{n+1} (1 - \text{tax rate}) (1 - \text{Reinvestment Rate})}{\text{Cost of capital} - \text{Expected growth rate}}\)

- This tax rate locks in forever. Does it make sense to use an effective tax rate?
- Are you reinvesting enough to sustain your stable growth rate? Reinv Rate = \(g/\text{ROC}\)
- Is the ROC that of a stable company?
- This is a mature company. It’s cost of capital should reflect that.
- This growth rate should be less than the nominal growth rate of the economy.
If your job is assessing value, here are you challenges...

- **Company's history**
  - Look at past growth in revenues & earnings and how much the company has had to invest to generate this growth.

- **Cash flows from existing assets**
  - Based on the current financial statements of the company, make assessments of earnings and cash flows from existing assets.

- **Competitors**
  - Look at the growth, profitability & reinvestment at competitors & determine your competitive advantages.

- **Market potential**
  - Make a judgment on the size, growth potential & profitability of the overall market served by the company.

- **Steady state**
  - Look at the largest and most mature companies your peer group to make a judgment on when stability will come to your company & what it will look like.

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

- **Past earnings**
  - Look at the variability of past earnings and the sources of the variability.

- **Past market prices**
  - If your company has been traded historically, get a measure the variability in stock prices.

- **Peer group**
  - Look at the costs of funding faced by peer group companies, similar to yours.
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></td>
<td>$7.67</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>
<tr>
<td>Interest expenses</td>
<td>$2.49</td>
<td>$5.30</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)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th></th>
<th>2012</th>
<th></th>
<th>2013</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>$</td>
<td>%</td>
<td>$</td>
<td>%</td>
<td>$</td>
</tr>
<tr>
<td>Google</td>
<td>32.09%</td>
<td>$27.74</td>
<td>31.46%</td>
<td>$32.73</td>
<td>33.24%</td>
<td>$38.83</td>
</tr>
<tr>
<td>Facebook</td>
<td>3.65%</td>
<td>$3.15</td>
<td>4.11%</td>
<td>$4.28</td>
<td>5.04%</td>
<td>$5.89</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>3.95%</td>
<td>$3.41</td>
<td>3.37%</td>
<td>$3.51</td>
<td>3.10%</td>
<td>$3.62</td>
</tr>
<tr>
<td>Microsoft</td>
<td>1.27%</td>
<td>$1.10</td>
<td>1.63%</td>
<td>$1.70</td>
<td>1.78%</td>
<td>$2.08</td>
</tr>
<tr>
<td>IAC</td>
<td>1.15%</td>
<td>$0.99</td>
<td>1.39%</td>
<td>$1.45</td>
<td>1.47%</td>
<td>$1.72</td>
</tr>
<tr>
<td>AOL</td>
<td>1.17%</td>
<td>$1.01</td>
<td>1.02%</td>
<td>$1.06</td>
<td>0.95%</td>
<td>$1.11</td>
</tr>
<tr>
<td>Amazon</td>
<td>0.48%</td>
<td>$0.41</td>
<td>0.59%</td>
<td>$0.61</td>
<td>0.71%</td>
<td>$0.83</td>
</tr>
<tr>
<td>Pandora</td>
<td>0.28%</td>
<td>$0.24</td>
<td>0.36%</td>
<td>$0.37</td>
<td>0.50%</td>
<td>$0.58</td>
</tr>
<tr>
<td>Twitter</td>
<td>0.16%</td>
<td>$0.14</td>
<td>0.28%</td>
<td>$0.29</td>
<td>0.50%</td>
<td>$0.58</td>
</tr>
<tr>
<td>Linkedin</td>
<td>0.18%</td>
<td>$0.16</td>
<td>0.25%</td>
<td>$0.26</td>
<td>0.32%</td>
<td>$0.37</td>
</tr>
<tr>
<td>Millennial Media</td>
<td>0.05%</td>
<td>$0.04</td>
<td>0.07%</td>
<td>$0.07</td>
<td>0.10%</td>
<td>$0.12</td>
</tr>
<tr>
<td>Other</td>
<td>55.59%</td>
<td>$48.05</td>
<td>55.47%</td>
<td>$57.71</td>
<td>52.29%</td>
<td>$61.09</td>
</tr>
<tr>
<td>Total Market</td>
<td>100%</td>
<td>$86.43</td>
<td>100.00%</td>
<td>$104.04</td>
<td>100.00%</td>
<td>$116.82</td>
</tr>
</tbody>
</table>

2. Make losses into profits

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

3. Reinvest for growth

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

Aswath Damodaran
Sweating the small stuff: Risk and Required Return

Risk in the discount rate

My estimate for Twitter

Cost of capital = 11.12% (.981) + 5.16% (.019) = 11.01%

Cost of Equity
11.12%

Cost of Debt
(2.5%+5.5%)(1-.40) = 5.16%

Weights
E = 98.11% D = 1.89%

Riskfree Rate
Riskfree rate = 2.5%

Risk Premium
6.15%

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

Risk in the discount rate

Survival Risk

Probability that the firm will not make it as a going concern

Certain to make it as going concern

Certain to fail

My assumption for Twitter
Terminal Value: 
\[
\frac{\text{FCFF}}{\text{Cost of capital} - \text{Reinvestment}} = \frac{1,466}{0.1112 - 0.025} = 26,657
\]

Cost of Capital: 
\[
\text{Cost of capital} = 0.981 \times (0.1112) + 0.019 \times (0.0516) = 0.1101
\]

Cost of Debt: 
\[
(0.25\% + 5.5\%)(1-0.40) = 5.16\%
\]

Risk Premium: 
\[
6.15\%
\]

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

Riskfree Rate: 
\[
\text{Riskfree rate} = 2.5\%
\]

Beta: 
\[
1.40
\]

Risk Premium: 
\[
6.15\%
\]

90% advertising (1.44) + 10% info svc (1.05)

D/E = 1.71%
Twitter Valuation after first earnings report: February 8, 2014

### Terminal Value

Terminal Value

\[
10 = \frac{1666}{0.08 - 0.025} = 31,741
\]

### Cost of capital

Cost of capital = 8.72\% (0.987) + 3.87\% (0.013) = 8.66\%

Cost of Debt

Cost of Debt

(2.5\%+3.5\%)(1-.355)

= 3.87\%

Riskfree Rate:

Riskfree rate = 2.75\%

### Beta

\[
\text{Beta} = 1.12
\]

### Risk Premium

Risk Premium

5.35\%

75% from US(5.00\%) + 25% from rest of world (6.93\%)

### Reinvestment Rate

Reinvestment Rate = 2.75\% /12\% = 22.92\%

### D/E

\[
D/E = 1.29\%
\]

### Value in stock

\[
\text{Value in stock} = 11,421 / 582.46 = 19.61
\]

### Value/share

\[
\text{Value/share} = \frac{11,421}{582.46} = 19.61
\]

### Cost of Debt

Cost of Debt

(2.5\%+3.5\%)(1-.355)

= 3.87\%

### Value of equity

Value of equity = 13,604

### Value in stock

Value in stock = 11,421

### Reinvestment

\[
\text{Reinvestment} = 2.522 \times 1.12 = 2.806
\]

### Operating assets

Operating assets = 11,767

### Cash

Cash = 2,234

### Debt

Debt = 397

### Options

Options = 2,183

### Value of equity

Value of equity = 13,604

### Value in stock

Value in stock = 11,421

### Value/share

\[
\text{Value/share} = \frac{11,421}{582.46} = 19.61
\]

### Whole Diagram

The whole diagram represents the valuation process of Twitter after its first earnings report on February 8, 2014. It includes calculations for terminal value, cost of capital, and other financial metrics. The diagram also includes projections for future revenues and operating income, showing growth rates and adjustments for taxes, reinvestment, and capital structure. The terminal value is calculated using the terminal year (11) EBIT (1-t) values, and the cost of capital is determined taking into account the riskfree rate, beta, and risk premium. The value of equity and the value in stock are calculated with the appropriate number of shares outstanding.
If your job is enhancing value, it's got to come from changing the fundamentals.
Three simple suggestions to make you better at intrinsic valuation

1. **Be honest about your biases/preconceptions**: The biggest bogeyman in most valuations is that your preconceptions and biases will lead your choices. While you can never be unbiased, being aware of your biases can help.

2. **Keep it simple**: Less is more in valuation. While it is easy to build bigger models and you have more access to data, parsimonious valuations often do a better job than complex ones.

3. **Face up to uncertainty**: Uncertainty is a feature, not a bug. Make the best estimates you can, with the information you have, recognize that everyone else faces the same uncertainty and understand that you don’t have to be right, just less wrong than everyone else.
PRICING
IT’S DEMAND AND SUPPLY
The determinants of price

- **Mood and Momentum**
  Price is determined in large part by mood and momentum, which, in turn, are driven by behavioral factors (panic, fear, greed).

- **Liquidity & Trading Ease**
  While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

- **The Market Price**

- **Incremental information**
  Since you make money on price changes, not price levels, the focus is on incremental information (news stories, rumors, gossip) and how it measures up, relative to expectations.

- **Group Think**
  To the extent that pricing is about gauging what other investors will do, the price can be determined by the "herd".

Aswath Damodaran
Tools for Pricing: Technical Analysis & Charting
Timing and Incremental Information

**Time = Money** | Superfast traders can act on market-moving news before other investors

High-speed traders pay to get news releases directly from companies, like Business Wire, that distribute them on behalf of public companies and government entities.

By the time regular traders can act on the news, high-speed traders may have already made their moves, sometimes beating the crowd by milliseconds.

Last December, high-speed traders acted within 50 milliseconds to sell the stock of a company with disappointing earnings news.

Sources: Bloomberg, Dow Jones and Thomson Reuters (publication times)
A more general tool: 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

Multiple = \[
\frac{\text{Numerator} = \text{What you are paying for the asset}}{\text{Denominator} = \text{What you are getting in return}}\]

**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
The market price of Twitter
Pricing Twitter- October 2013

Twitter’s value based on revenues = $543 million * ?
Twitter’s value based on # users = 237 million * ?

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<tr>
<td>Facebook, Inc. (NasdaqGS:FB)</td>
<td>$100,017.00</td>
<td>$107,909.00</td>
<td>16.35</td>
<td>36.20</td>
<td>193.73</td>
<td>$97.22</td>
<td>$20.36</td>
</tr>
<tr>
<td>LinkedIn Corporation (NYSE:LNKD)</td>
<td>$28,448.50</td>
<td>$29,321.90</td>
<td>22.87</td>
<td>179.26</td>
<td>729.40</td>
<td>$130.32</td>
<td>$6.91</td>
</tr>
<tr>
<td>Facebook + LinkedIn</td>
<td>$128,465.50</td>
<td>$137,230.90</td>
<td>17.45</td>
<td>43.97</td>
<td>229.79</td>
<td>$102.79</td>
<td>$14.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Media/Internet Medley</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<td>36.20</td>
<td>193.73</td>
<td>$97.22</td>
<td>$20.36</td>
</tr>
<tr>
<td>Google Inc. (NasdaqGS:GOOG)</td>
<td>$248,856.30</td>
<td>$296,078.30</td>
<td>4.46</td>
<td>14.64</td>
<td>25.45</td>
<td>$270.89</td>
<td>$6.61</td>
</tr>
<tr>
<td>LinkedIn Corporation (NYSE:LNKD)</td>
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<td>$130.32</td>
<td>$6.91</td>
</tr>
<tr>
<td>Netflix</td>
<td>$13,959.00</td>
<td>$14,539.00</td>
<td>3.54</td>
<td>81.20</td>
<td>304.80</td>
<td>$403.86</td>
<td>$7.11</td>
</tr>
<tr>
<td>OpenTable, Inc. (NasdaqGS:OPEN)</td>
<td>$1,841.70</td>
<td>$1,733.70</td>
<td>9.45</td>
<td>30.35</td>
<td>59.99</td>
<td>$15.34</td>
<td>$3.02</td>
</tr>
<tr>
<td>Pandora Media, Inc. (NYSE:P)</td>
<td>$4,163.40</td>
<td>$4,232.30</td>
<td>7.89</td>
<td>NA</td>
<td>NA</td>
<td>$21.16</td>
<td>$5.72</td>
</tr>
<tr>
<td>RetailMeNot</td>
<td>$1,723.60</td>
<td>$1,715.00</td>
<td>10.20</td>
<td>34.20</td>
<td>64.96</td>
<td>$147.84</td>
<td>$4.60</td>
</tr>
<tr>
<td>Trulia, Inc. (NYSE:TRLA)</td>
<td>$1,847.39</td>
<td>$1,853.10</td>
<td>17.75</td>
<td>NA</td>
<td>NA</td>
<td>$59.02</td>
<td>$3.57</td>
</tr>
<tr>
<td>Yelp, Inc. (NYSE:YELP)</td>
<td>$4,006.10</td>
<td>$4,102.90</td>
<td>22.42</td>
<td>NA</td>
<td>NA</td>
<td>$41.03</td>
<td>$2.67</td>
</tr>
<tr>
<td>Zillow, Inc. (NasdaqGS:Z)</td>
<td>$3,419.80</td>
<td>$3,589.50</td>
<td>22.48</td>
<td>NA</td>
<td>NA</td>
<td>$78.20</td>
<td>$5.22</td>
</tr>
<tr>
<td>Yahoo! Inc. (NasdaqGS:YHOO)</td>
<td>$27,262.80</td>
<td>$29,854.60</td>
<td>5.65</td>
<td>21.24</td>
<td>7.19</td>
<td>$106.24</td>
<td>$2.55</td>
</tr>
<tr>
<td>Groupon</td>
<td>$5,857.00</td>
<td>$7,039.00</td>
<td>2.42</td>
<td>44.04</td>
<td>NA</td>
<td>$168.80</td>
<td>$0.62</td>
</tr>
<tr>
<td>Travelzoo Inc. (NasdaqGS:TZOO)</td>
<td>$347.20</td>
<td>$421.10</td>
<td>2.23</td>
<td>12.81</td>
<td>23.39</td>
<td>$16.20</td>
<td>$0.95</td>
</tr>
<tr>
<td>Aggregate</td>
<td>$441,349.79</td>
<td>$502,389.40</td>
<td>5.82</td>
<td>20.43</td>
<td>30.76</td>
<td>$157.97</td>
<td>$5.96</td>
</tr>
<tr>
<td>Median</td>
<td>8.67</td>
<td>32.27</td>
<td>59.99</td>
<td>101.73</td>
<td>4.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>10.97</td>
<td>47.44</td>
<td>159.96</td>
<td>121.98</td>
<td>5.42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rules for the road: Relative valuation

1. **Be consistent**: Both the value (the numerator) and the standardizing variable (the denominator) should be to the same claimholders in the firm. In other words, the value of equity should be divided by equity earnings or equity book value, and firm value should be divided by firm earnings or book value.

2. **Play Moneyball**: Look at the cross sectional distribution of a multiple and form judgments, based on the data, of what is cheap and what is expensive.

3. **Make your implicit assumptions explicit**: Multiples are standardized values, and as a consequence are driven by exactly the same variables that determine value – cash flows, growth and risk.

4. **Control for differences (and go past story telling)**: No matter how carefully you control for differences across companies, there will still be residual differences on the fundamentals across the firms. You have to go beyond story telling and use the data to analyze how the market treats these differences.
PRICE OR VALUE?
PICK YOUR POISON!
What’s your game?

- **The transactors**
  - Traders: Oscar Wilde’s definition of a cynic: “knows the price of everything, the value of nothing”.
  - Salespeople: Caveat emptor!
  - Deal intermediaries: Get the deal done (even if it is not a good deal)!

- **The muddled middle**
  - Academic value: The cognitive dissonance of the “efficient market”
  - Accounting value: Rule maker, rule maker, make up your mind!
  - Legal value: The bane of the expert witness!

- **The investors**
  - Owners of businesses: Except if you want to run it for the long term.
  - Investors in companies: With faith and patience, you can take advantage of Mr. Market.
  - Long term consultants: You have to live with the consequences of the advice that you mete out to your clients.

Aswath Damodaran
Sometimes, you don’t have a choice..

At $142.4 Million, Triptych Is the Most Expensive Artwork Ever Sold at an Auction
A fair price for gold? How about value?
And for Bitcoins?

![Bitcoin Price Index Chart](chart.png)
In the muddled middle, what you get is neither price nor value, but mush..

- **The “fair value accounting” oxymoron**: Fair value accounting requires accountants to value assets based upon what “market participants” will pay for those assets in arms length transactions today.

- **Legal Valuation**: In courts, experts witnesses are generally asked to opine on the values of assets, often in the abstract. It is unclear whether they are being asked to price assets or value assets, and that allows them to stake extreme positions (depending on which side is paying them).

- **Academic valuation**: Much of what passes for valuation in financial theory is just pricing.
In the investing world, there are three views of “the gap”

<table>
<thead>
<tr>
<th>View of the gap</th>
<th>Investment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Efficient Marketer</td>
<td>Index funds</td>
</tr>
<tr>
<td>The “value” extremist</td>
<td>Buy and hold stocks where value &gt; price</td>
</tr>
<tr>
<td>You view pricers as dilettantes who will move on to fad and fad. Eventually, the price will converge on value.</td>
<td></td>
</tr>
<tr>
<td>The pricing extremist</td>
<td>(1) Look for mispriced securities. (2) Get ahead of shifts in demand/momentum.</td>
</tr>
<tr>
<td>Value is only in the heads of the “eggheads”. Even if it exists (and it is questionable), price may never converge on value.</td>
<td></td>
</tr>
</tbody>
</table>
The pricer’s dilemma..

- **No anchor**: If you do not believe in intrinsic value and make no attempt to estimate it, you have no moorings when you invest. You will therefore be pushed back and forth as the price moves from high to low. In other words, everything becomes relative and you can lose perspective.

- **Reactive**: Without a core measure of value, your investment strategy will often be reactive rather than proactive.

- **Crowds are fickle and tough to get a read on**: The key to being successful as a pricer is to be able to read the crowd mood and to detect shifts in that mood early in the process. By their nature, crowds are tough to read and almost impossible to model systematically.
The valuer’s dilemma

- **Uncertainty about the magnitude of the gap:**
  - Margin of safety: Many value investors swear by the notion of the “margin of safety” as protection against risk/uncertainty.
  - Collect more information: Collecting more information about the company is viewed as one way to make your investment less risky.
  - Ask what if questions: Doing scenario analysis or what if analysis gives you a sense of whether you should invest.
  - Confront uncertainty: Face up to the uncertainty, bring it into the analysis and deal with the consequences.

- **Uncertainty about gap closing:** This is tougher and you can reduce your exposure to it by
  - Lengthening your time horizon
  - Providing or looking for a catalyst that will cause the gap to close.
An example: Apple – Price versus Value (my estimates) from 2011 to 2014
And the uncertainty is greater in some assets (stocks) than others

- In which of these two cities would you find it easier to forecast the weather?

### Weather changeability for Honolulu, Hawaii

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Last Month</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average change in high temp</td>
<td>1.7°</td>
<td>1.2°</td>
</tr>
<tr>
<td>Average change in low temp</td>
<td>1.5°</td>
<td>2.0°</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precipitation</th>
<th>Last Month</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance of dry day after a precip day</td>
<td>67%</td>
<td>81%</td>
</tr>
<tr>
<td>Chance of precip day after a dry day</td>
<td>7%</td>
<td>13%</td>
</tr>
</tbody>
</table>

### Weather changeability for Epping, North Dakota

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Last Month</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average change in high temp</td>
<td>8.5°</td>
<td>7.7°</td>
</tr>
<tr>
<td>Average change in low temp</td>
<td>7.1°</td>
<td>8.6°</td>
</tr>
</tbody>
</table>

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<tr>
<th>Precipitation</th>
<th>Last Month</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance of dry day after a precip day</td>
<td>50%</td>
<td>65%</td>
</tr>
<tr>
<td>Chance of precip day after a dry day</td>
<td>38%</td>
<td>20%</td>
</tr>
</tbody>
</table>
But the payoff is greatest where there is the most uncertainty...

Weather forecast accuracy for Honolulu, Hawaii

<table>
<thead>
<tr>
<th>Last Month</th>
<th>Last Year</th>
<th>Metric</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MeteoGroup</td>
<td>98.44%</td>
<td>88.50%</td>
<td></td>
</tr>
<tr>
<td>Persistence</td>
<td>81.00%</td>
<td>85.87%</td>
<td></td>
</tr>
<tr>
<td>CustomWeather</td>
<td>78.23%</td>
<td>81.82%</td>
<td></td>
</tr>
<tr>
<td>The Weather Channel</td>
<td>73.12%</td>
<td>81.56%</td>
<td></td>
</tr>
<tr>
<td>AccuWeather</td>
<td>69.89%</td>
<td>80.44%</td>
<td></td>
</tr>
<tr>
<td>Weather Underground</td>
<td>62.10%</td>
<td>67.07%</td>
<td></td>
</tr>
<tr>
<td>National Weather Service</td>
<td>48.39%</td>
<td>59.80%</td>
<td></td>
</tr>
<tr>
<td>Foreca</td>
<td>44.35%</td>
<td>57.52%</td>
<td></td>
</tr>
<tr>
<td>WeatherBug</td>
<td>32.26%</td>
<td>37.09%</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
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<tr>
<td>MeteoGroup</td>
<td>62.50%</td>
<td>61.61%</td>
<td></td>
</tr>
<tr>
<td>The Weather Channel</td>
<td>61.31%</td>
<td>61.31%</td>
<td></td>
</tr>
<tr>
<td>AccuWeather</td>
<td>60.42%</td>
<td>59.85%</td>
<td></td>
</tr>
<tr>
<td>Weather Underground</td>
<td>59.17%</td>
<td>55.17%</td>
<td></td>
</tr>
<tr>
<td>National Weather Service</td>
<td>54.76%</td>
<td>54.46%</td>
<td></td>
</tr>
<tr>
<td>CustomWeather</td>
<td>49.01%</td>
<td>38.01%</td>
<td></td>
</tr>
<tr>
<td>Persistence</td>
<td>46.00%</td>
<td>46.00%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Average change low</td>
<td>1.5°C</td>
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</tr>
<tr>
<td>Average change low</td>
<td>7.1°C</td>
<td>8.6°C</td>
</tr>
<tr>
<td>temperature day-to-day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further changeability analysis

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The choice is yours (and there is no right one)

1. **Do your job**: There is no right or wrong way to put a number on an asset. If your job is to price it, that is exactly what you should do. If it is to value it, go for an intrinsic value approach.

2. **Don’t be delusional**: If you are pricing an asset, don’t get distracted too much by fundamentals and intrinsic value concerns. If you are valuing an asset, don’t let the pricing process (mood & momentum) feed back into your valuation.

3. **Play to your strengths**: To be a successful investor, you have to know what makes you tick and pick the approach that best fits you.