VALUATION: SIX LESSONS TO TAKE AWAY!

July 2015

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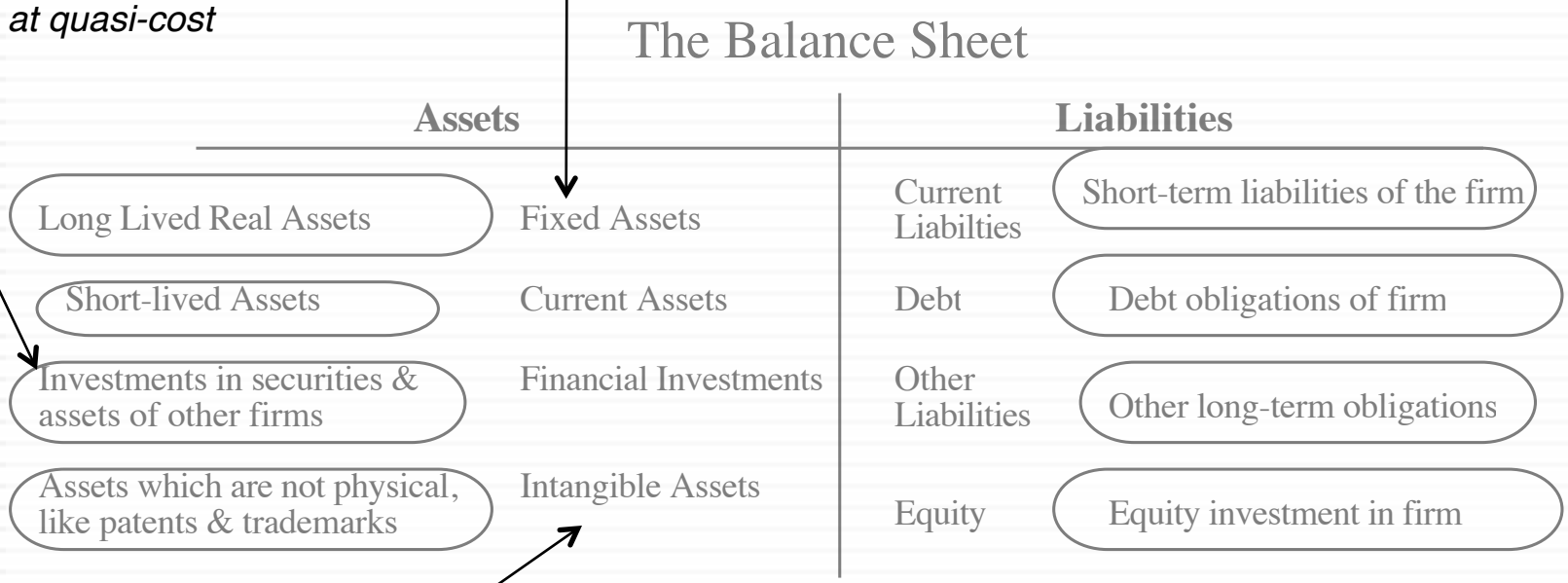
I. Don't mistake accounting for finance

Valued based upon motive for investment – some marked to market, some recorded at cost and some at quasi-cost

Assets are recorded at original cost, adjusted for depreciation.



True intangible assets like brand name, patents and customer did not show up. The only intangible asset of any magnitude (goodwill) is a plug variable that is of consequence only if you do an acquisition.

Equity reflects original capital invested and historical retained earnings.

The financial balance sheet

Recorded at intrinsic value (based upon cash flows and risk), not at original cost

Value will depend upon magnitude of growth investments and excess returns on these investments

Intrinsic value of equity, reflecting intrinsic value of assets, net of true value of debt outstanding.

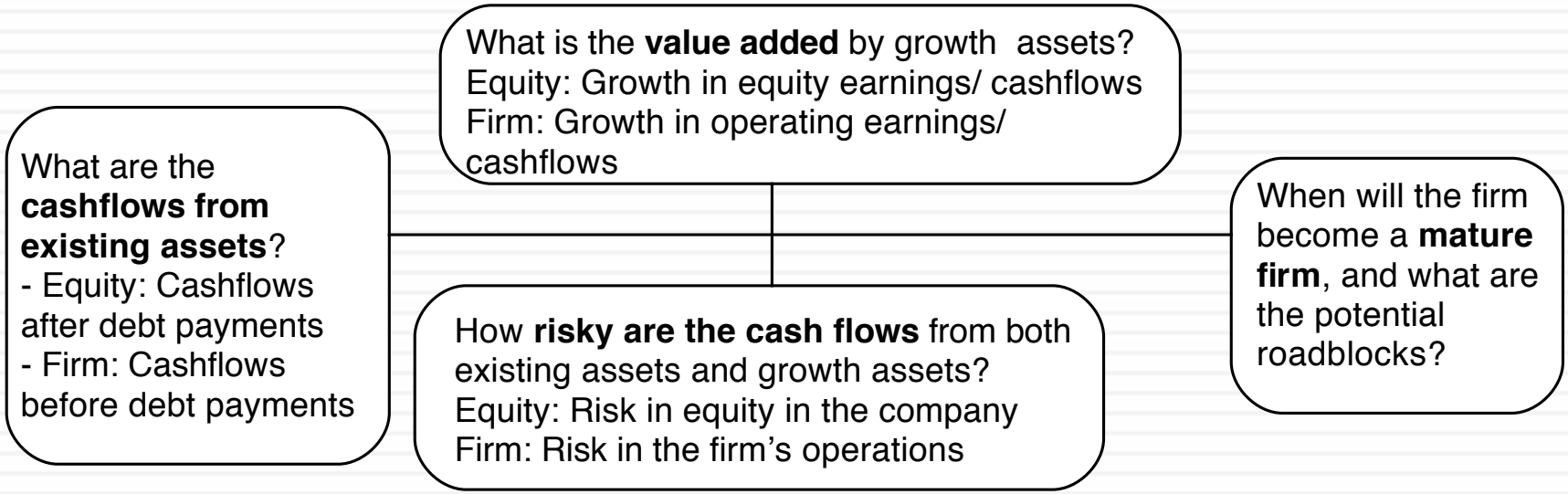
II. Don't assume that D+CF = DCF

- The value of a risky asset can be estimated by discounting the expected cash flows on the asset over its life at a risk-adjusted discount rate:

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

1. *The IT Proposition*: If "it" does not affect the cash flows or alter risk (thus changing discount rates), "it" cannot affect value.
2. *The DUH Proposition*: For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.
3. *The DON'T FREAK OUT Proposition*: Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.

The drivers of value..



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.

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

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

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

1. Cash Flows

To get to cash flow	Here is why
Operating Earnings	This is the earnings before interest & taxes you generate from your existing assets. Operating Earnings = Revenues * Operating Margin Measures the operating efficiency of your assets & can be grown either by growing revenues and/or improving margins.
(minus) Taxes	These are the taxes you would pay on your operating income and are a function of the tax code under which you operate & your fidelity to that code.
(minus) Reinvestment	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.
Free Cash Flow to the Firm	This is a pre-debt cash flow that will be shared by lenders (as interest & principal payments) and by equity investors (as dividends & buybacks).

2. Discount rates

Expected Return on a Risky Investment = Cost of Equity

=

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.

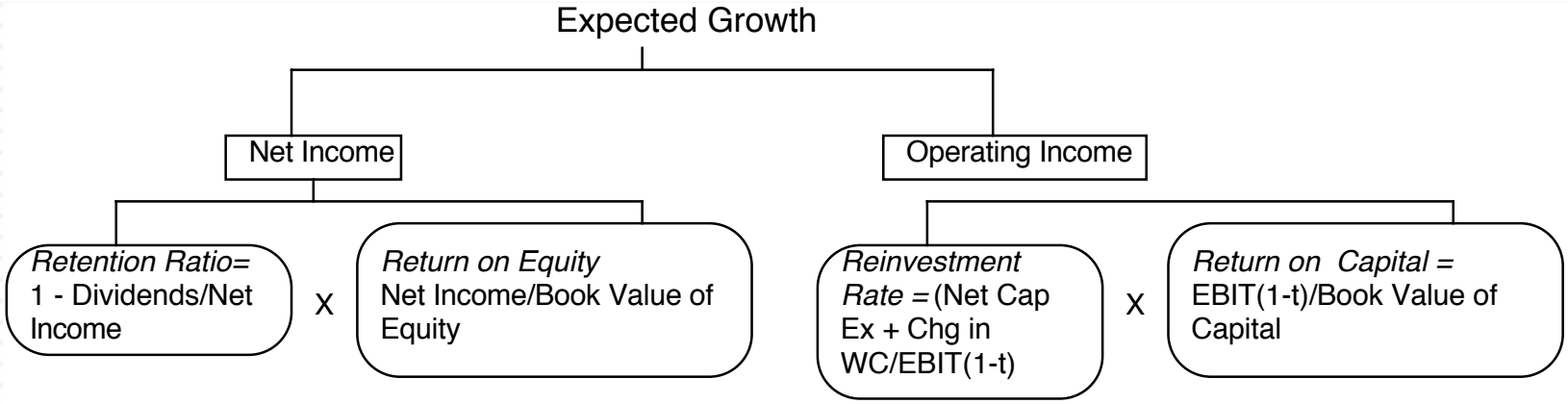
Determined by the business or businesses that you operate in, with more exposure to macro economic risk translating into a higher beta.

X

Equity Risk Premium
Premium investors demand over and above the risk free rate for investing in equities as a class.

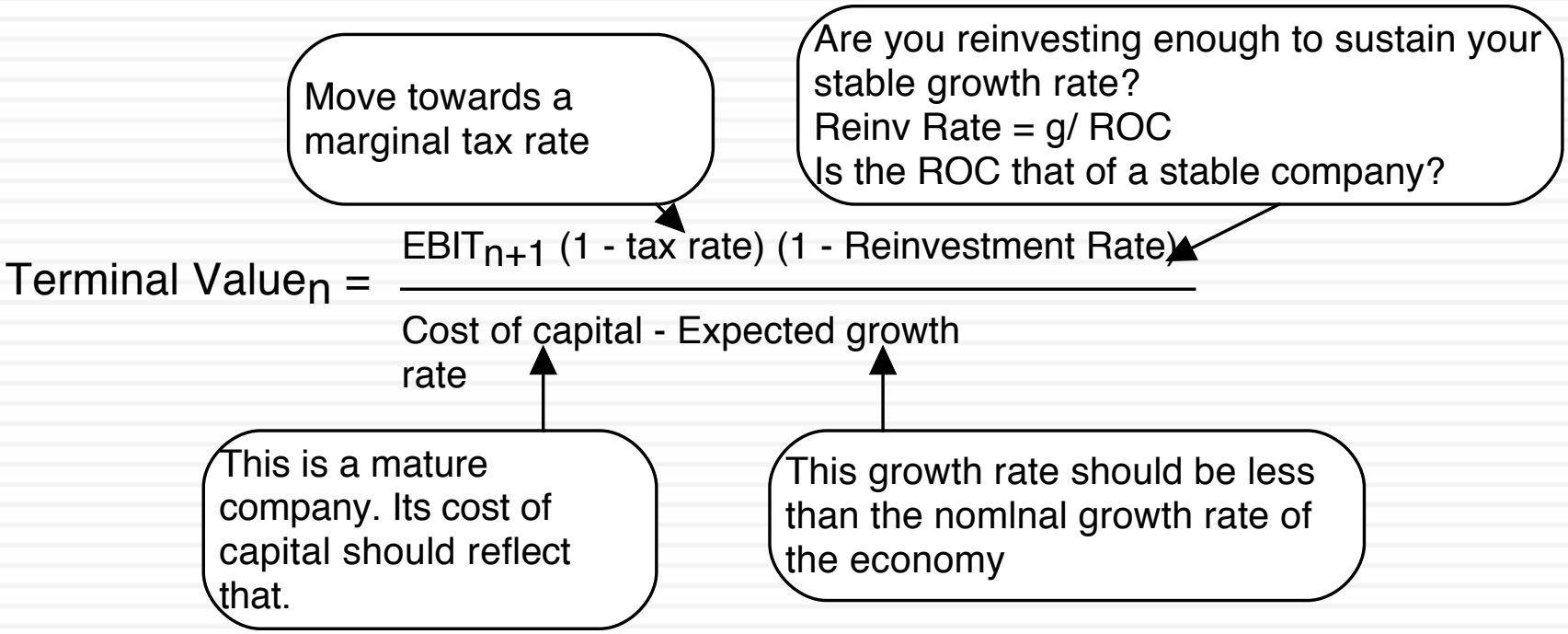
Function of the countries that you do business in and how much value you derive from each country.

3. Expected Growth



- Quality growth is rare and 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.

4. The Terminal Value



Alibaba: Pre-IPO valuation - September 2, 2014 (in US $)

	T12M	2012-13
Revenues	$9,268	$4,821
Operating Income	$4,702	$1,777
Effective tax rate	11.92%	
Operating Margin	50.73%	

Revenue growth of **25%** a year for 5 years, tapering down to 2.63% in year 10

Pre-tax operating margin decreases to 40% over time & tax rate rises to 25%

Sales to capital ratio maintained at 2.00

Stable Growth
g = 2.41%
Cost of capital = 8%
ROC= 8%;
Reinvestment Rate= 2.41%/8% = 30.125%

Terminal Value$_{10}$= 10,353/(.08-0241) = $185,198

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Revenue growth rate	25.00%	25.00%	25.00%	25.00%	25.00%	20.48%	15.96%	11.45%	6.93%	2.41%
Revenues	$ 11,585	$ 14,481	$ 18,101	$ 22,626	$ 28,283	$ 34,075	$ 39,515	$ 44,038	$ 47,089	$ 48,224
EBIT (Operating) margi	49.66%	48.59%	47.51%	46.44%	45.37%	44.29%	43.22%	42.15%	41.07%	40.00%
EBIT (Operating incom	$ 5,753	$ 7,035	$ 8,600	$ 10,507	$ 12,831	$ 15,093	$ 17,078	$ 18,560	$ 19,341	$ 19,290
Tax rate	11.92%	11.92%	11.92%	11.92%	11.92%	14.54%	17.15%	19.77%	22.38%	25.00%
EBIT(1-t)	$ 5,067	$ 6,197	$ 7,575	$ 9,255	$ 11,301	$ 12,899	$ 14,149	$ 14,891	$ 15,012	$ 14,467
- Reinvestment	$ 1,158	$ 1,448	$ 1,810	$ 2,263	$ 2,828	$ 2,896	$ 2,720	$ 2,261	$ 1,525	$ 567
FCFF	$ 3,908	$ 4,749	$ 5,765	$ 6,992	$ 8,473	$ 10,002	$ 11,429	$ 12,630	$ 13,486	$ 13,900

Operating assets	$137,386
+ Cash	9330
- Debt	10068
+ Equity investments	2,087
+ Alipay provision	3,000
+ IPO Proceeds (est)	20,000
- Options	696
Value of equity	161,039
Value per share	$65.98

Term yr	
EBIT (1-t)	$14,816
- Reinv	4,463
FCFF	10,353

Cost of capital = 8.90% (.943) + 3.00% (.057) = 8.56%

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

Cost of Equity
8.90%

Cost of Debt
4% (1-.25) = 3.00%

Weights
E = 94.3% D = 5.7%

Riskfree Rate:
Riskfree rate = 2.41%

+

Beta
1.092

Unlevered Beta: 1.044 (70% advertising, 30% online retailing)

D/E = 6.07%

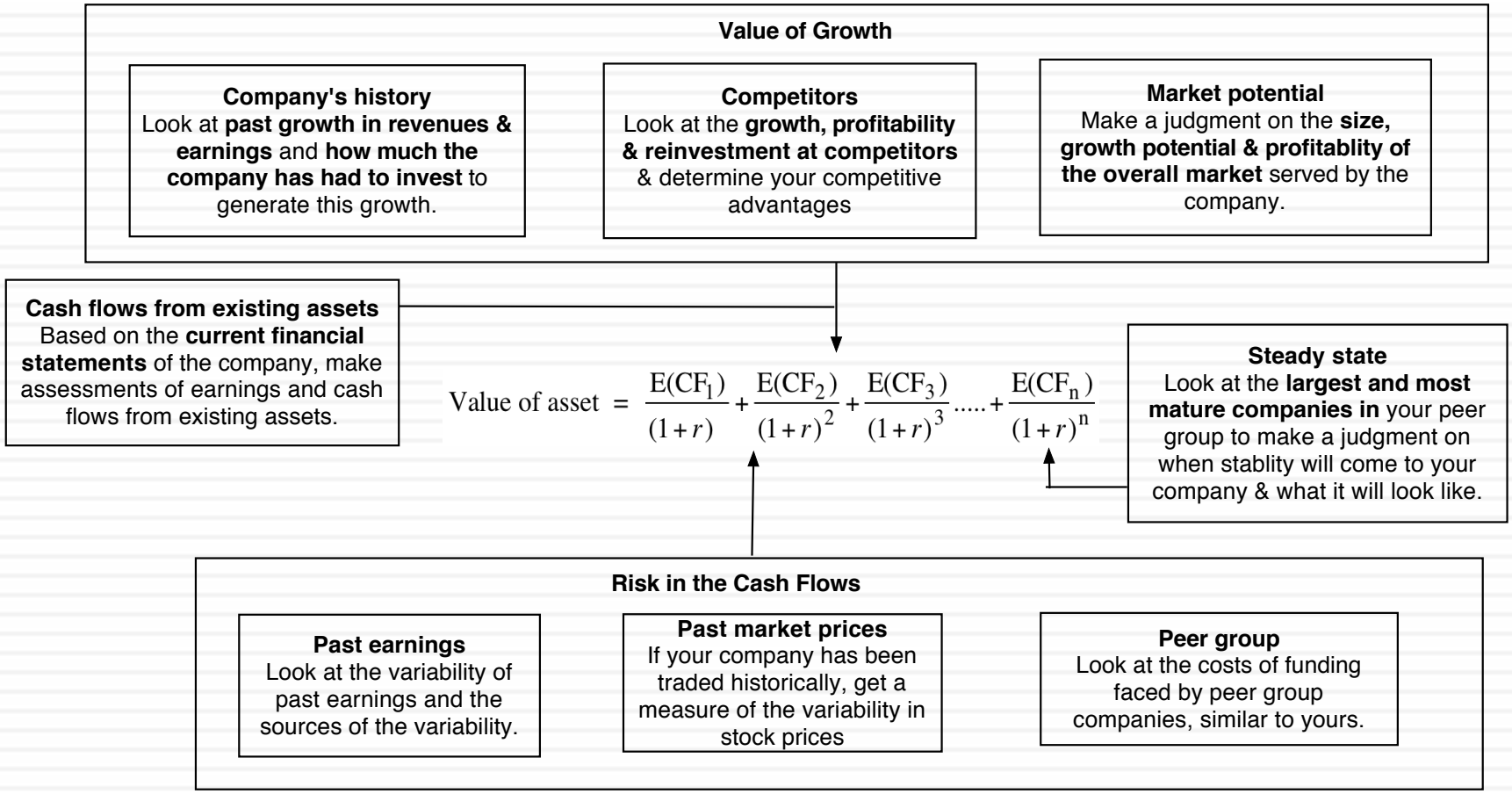
X

ERP
5.94%

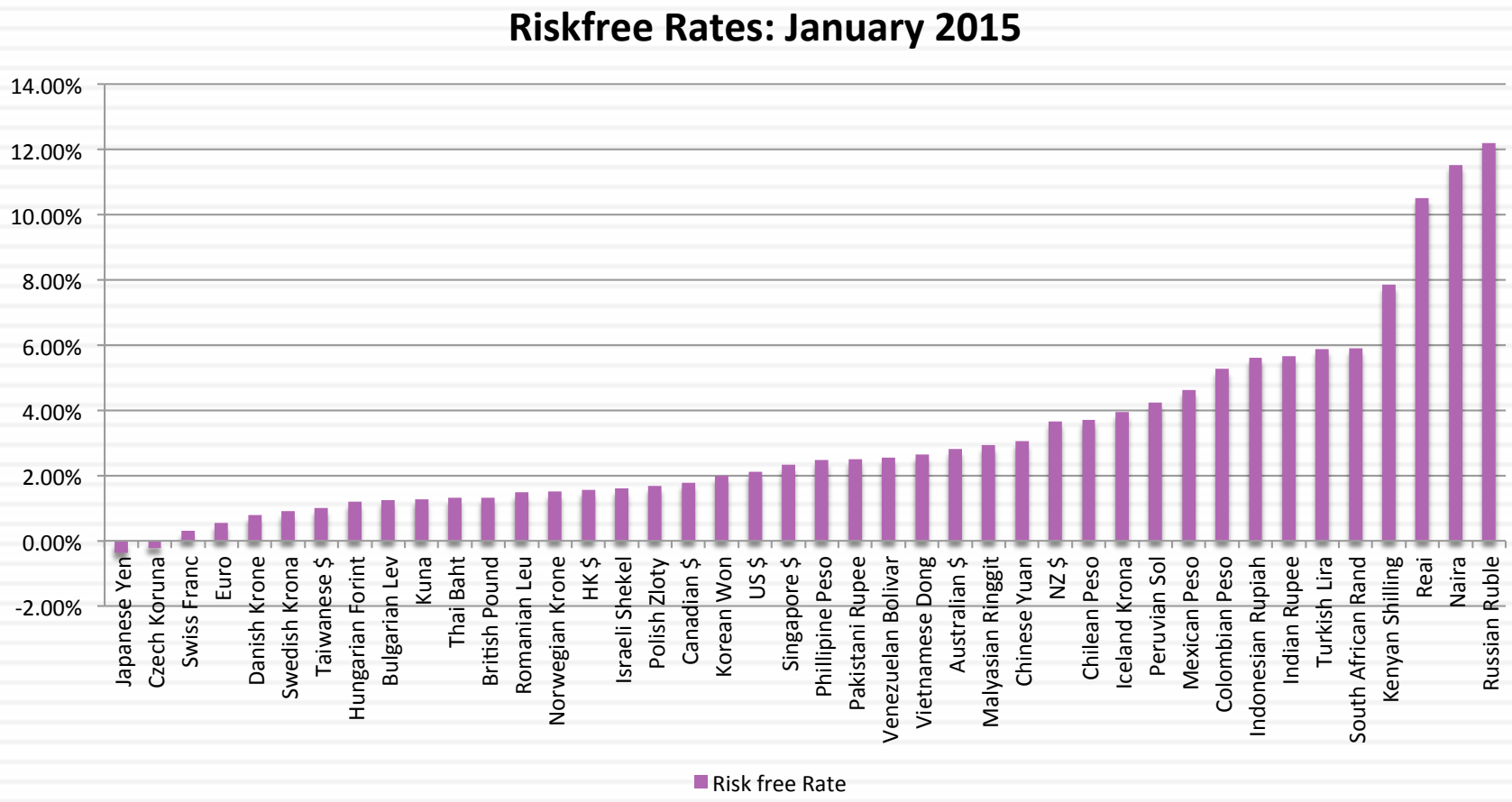
China	90.29%	5.90%
Global	9.71%	6.35%
Alibaba	100.00%	5.94%

Two days after this valuation, the company (and its bankers) valued itself at about $155 billion and the shares at $63 apiece. The offering price was raised to $69 and the opening price was $93/share.

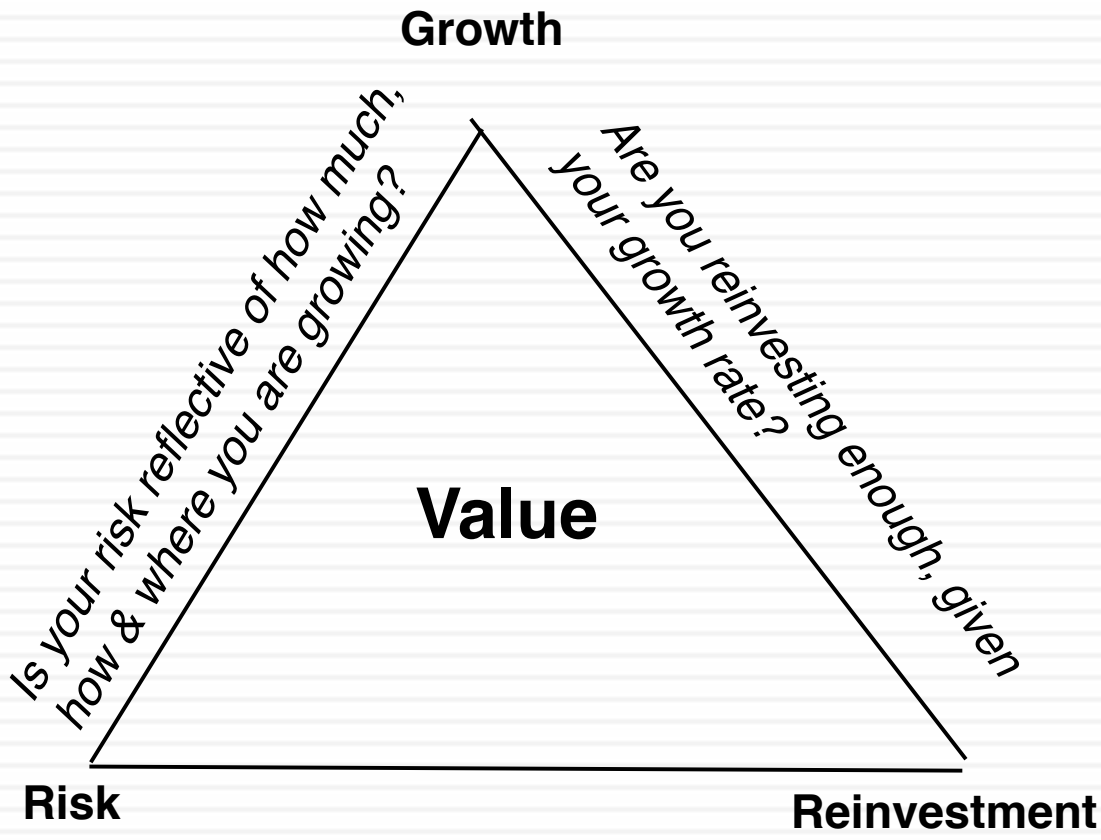
If your job is assessing value, here are your challenges…



1. Match your cash flows to your discount rates..



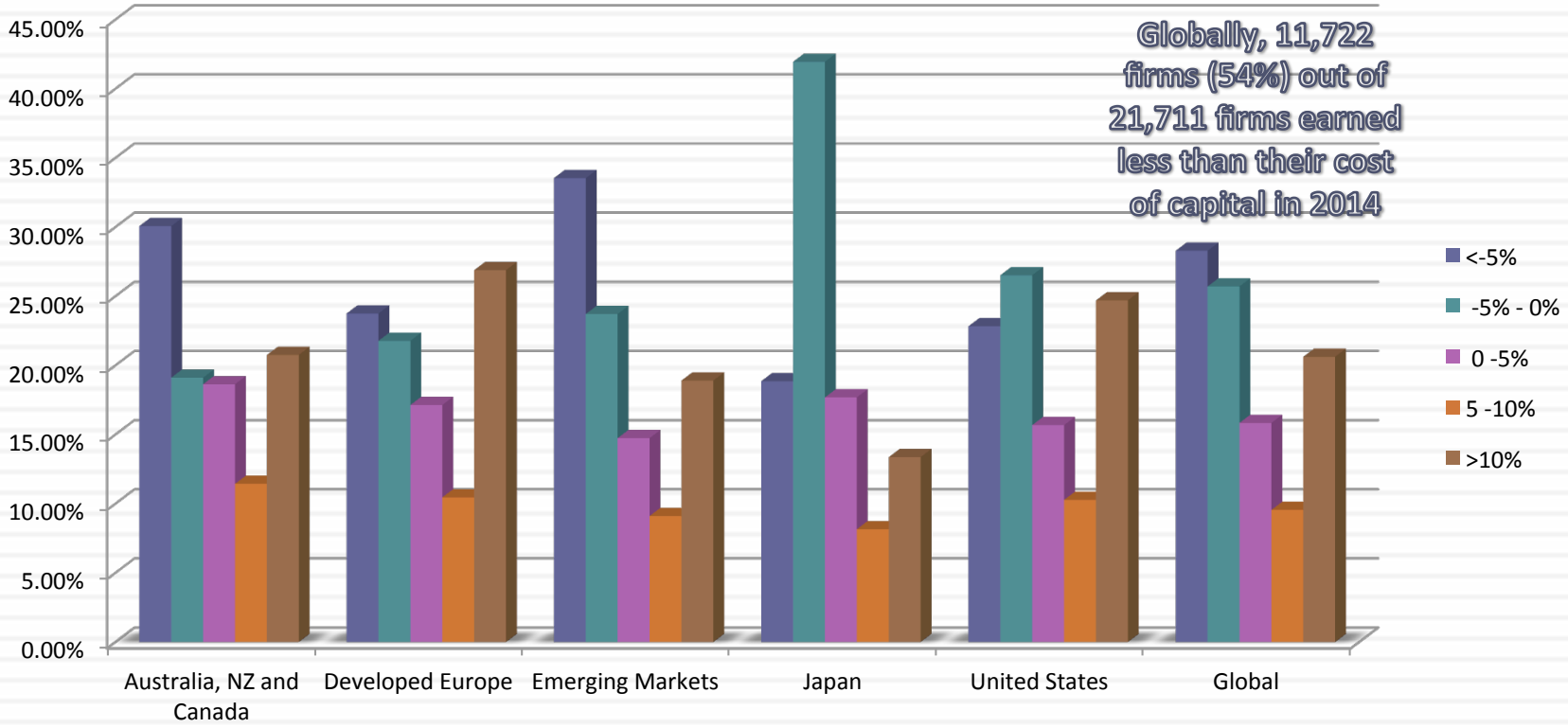
2. Don't let your inputs be at war with each other..



Is your risk consistent with your reinvestment strategy?

And consider the trade offs..

Excess Return (ROC minus Cost of Capital) for firms with market capitalization> $50 million: Global in 2014



3. Globalization is not a buzz word

- As companies get globalized, the valuations that we do have to reflect that globalization. In particular, we need to be wary of
  - Currency mismatches: Multinationals derive their revenues in many currencies but you have to be currency-consistent.
  - Beta gaming: When a company is listed in many markets, you can get very different betas, depending on how you set up and run a beta regression
  - Equity Risk Premiums: The standard practice of estimating equity risk premiums based on your country of incorporation will lead to skewed valuations.

ERP : Jan 2015

Andorra	8.15%	2.40%	Italy	8.60%	2.85%
Austria	5.75%	0.00%	Jersey	6.35%	0.60%
Belgium	6.65%	0.90%	Liechtenstein	5.75%	0.00%
Cyprus	15.50%	9.75%	Luxembourg	5.75%	0.00%
Denmark	5.75%	0.00%	Malta	7.55%	1.80%
Finland	5.75%	0.00%	Netherlands	5.75%	0.00%
France	6.35%	0.60%	Norway	5.75%	0.00%
Germany	5.75%	0.00%	Portugal	9.50%	3.75%
Greece	17.00%	11.25%	Spain	8.60%	2.85%
Guernsey	6.35%	0.60%	Sweden	5.75%	0.00%
Iceland	9.05%	3.30%	Switzerland	5.75%	0.00%
Ireland	8.15%	2.40%	Turkey	9.05%	3.30%
Isle of Man	6.35%	0.60%	UK	6.35%	0.60%
			W. Europe	**6.88%**	**1.13%**

Albania	12.50%	6.75%
Armenia	10.25%	4.50%
Azerbaijan	9.05%	3.30%
Belarus	15.50%	9.75%
Bosnia	15.50%	.75%
Bulgaria	8.60%	2.85%
Croatia	9.50%	3.75%
Czech Repub	6.80%	1.05%
Estonia	6.80%	1.05%
Georgia	11.15%	5.40%
Hungary	9.50%	3.75%
Kazakhstan	8.60%	2.85%
Latvia	8.15%	2.40%
Lithuania	8.15%	2.40%
Macedonia	11.15%	5.40%
Moldova	15.50%	9.75%

Montenegro	11.15%	5.40%
Poland	7.03%	1.28%
Romania	9.05%	3.30%
Russia	8.60%	2.85%
Serbia	12.50%	6.75%
Slovakia	7.03%	1.28%
Slovenia	9.50%	3.75%
Ukraine	20.75%	15.00%
E. Europe	**9.08%**	**3.33%**

Canada	5.75%	0.00%
US	5.75%	0.00%
North America	**5.75%**	**0.00%**

Argentina	17.00%	11.25%
Belize	19.25%	13.50%
Bolivia	11.15%	5.40%
Brazil	8.60%	2.85%
Chile	6.65%	0.90%
Colombia	8.60%	2.85%
Costa Rica	9.50%	3.75%
Ecuador	15.50%	9.75%
El Salvador	11.15%	5.40%
Guatemala	9.50%	3.75%
Honduras	15.50%	9.75%
Mexico	7.55%	1.80%
Nicaragua	15.50%	9.75%
Panama	8.60%	2.85%
Paraguay	10.25%	4.50%
Peru	7.55%	1.80%
Suriname	11.15%	5.40%
Uruguay	8.60%	2.85%
Venezuela	17.00%	11.25%
Latin America	**9.95%**	**4.20%**

Angola	10.25%	4.50%
Botswana	7.03%	1.28%
Burkina Faso	15.50%	9.75%
Cameroon	14.00%	8.25%
Cape Verde	14.00%	8.25%
Congo (DR)	15.50%	9.75%
Congo (Republic)	11.15%	5.40%
Côte d'Ivoire	12.50%	6.75%
Egypt	17.00%	11.25%
Ethiopia	12.50%	6.75%
Gabon	11.15%	5.40%
Ghana	14.00%	8.25%
Kenya	12.50%	6.75%
Morocco	9.50%	3.75%
Mozambique	12.50%	6.75%
Namibia	9.05%	3.30%
Nigeria	11.15%	5.40%
Rwanda	14.00%	8.25%
Senegal	12.50%	6.75%
South Africa	8.60%	2.85%
Tunisia	11.15%	5.40%
Uganda	12.50%	6.75%
Zambia	12.50%	6.75%
Africa	**11.73%**	**5.98%**

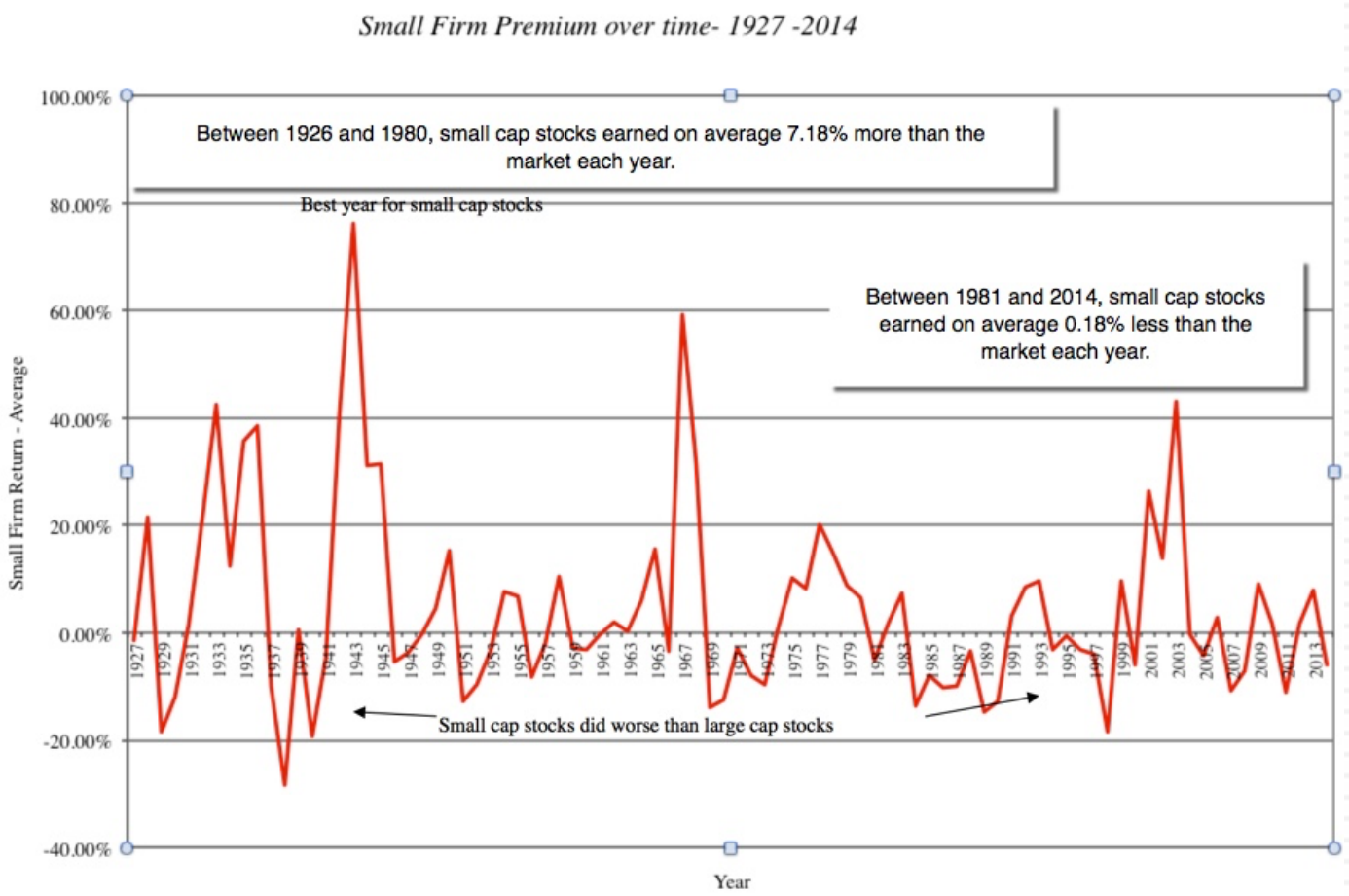
Abu Dhabi	6.50%	0.75%
Bahrain	8.60%	2.85%
Israel	6.80%	1.05%
Jordan	12.50%	6.75%
Kuwait	6.50%	0.75%
Lebanon	14.00%	8.25%
Oman	6.80%	1.05%
Qatar	6.50%	0.75%
Ras Al Khaimah	7.03%	1.28%
Saudi Arabia	6.65%	0.90%
Sharjah	7.55%	1.80%
UAE	6.50%	0.75%
Middle East	**6.85%**	**1.10%**

Bangladesh	11.15%	5.40%
Cambodia	14.00%	8.25%
China	6.65%	0.90%
Fiji	12.50%	6.75%
Hong Kong	6.35%	0.60%
India	9.05%	3.30%
Indonesia	9.05%	3.30%
Japan	6.80%	1.05%
Korea	6.65%	0.90%
Macao	6.50%	0.75%
Malaysia	7.55%	1.80%
Mauritius	8.15%	2.40%
Mongolia	14.00%	8.25%
Pakistan	17.00%	11.25%
Papua New Guinea	12.50%	6.75%
Philippines	8.60%	2.85%
Singapore	5.75%	0.00%
Sri Lanka	12.50%	6.75%
Taiwan	6.65%	0.90%
Thailand	8.15%	2.40%
Vietnam	12.50%	6.75%
Asia	**7.26%**	**1.51%**

Black #: Total ERP
Red #: Country risk premium
AVG: GDP weighted average

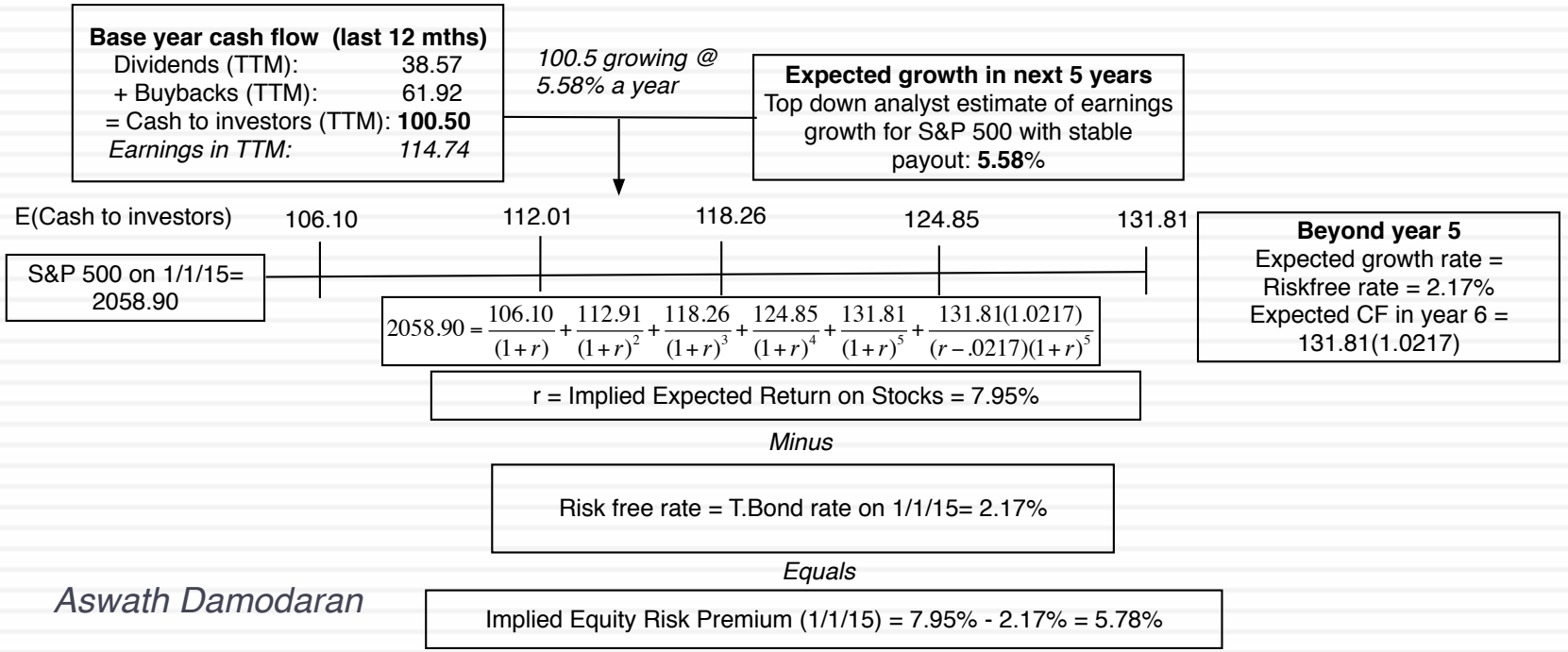
Australia	5.75%	0.00%
Cook Islands	12.50%	6.75%
New Zealand	5.75%	0.00%
Australia & NZ	**5.75%**	**0.00%**

4. Everyone may do it, but that does not make it right.. The small cap premium



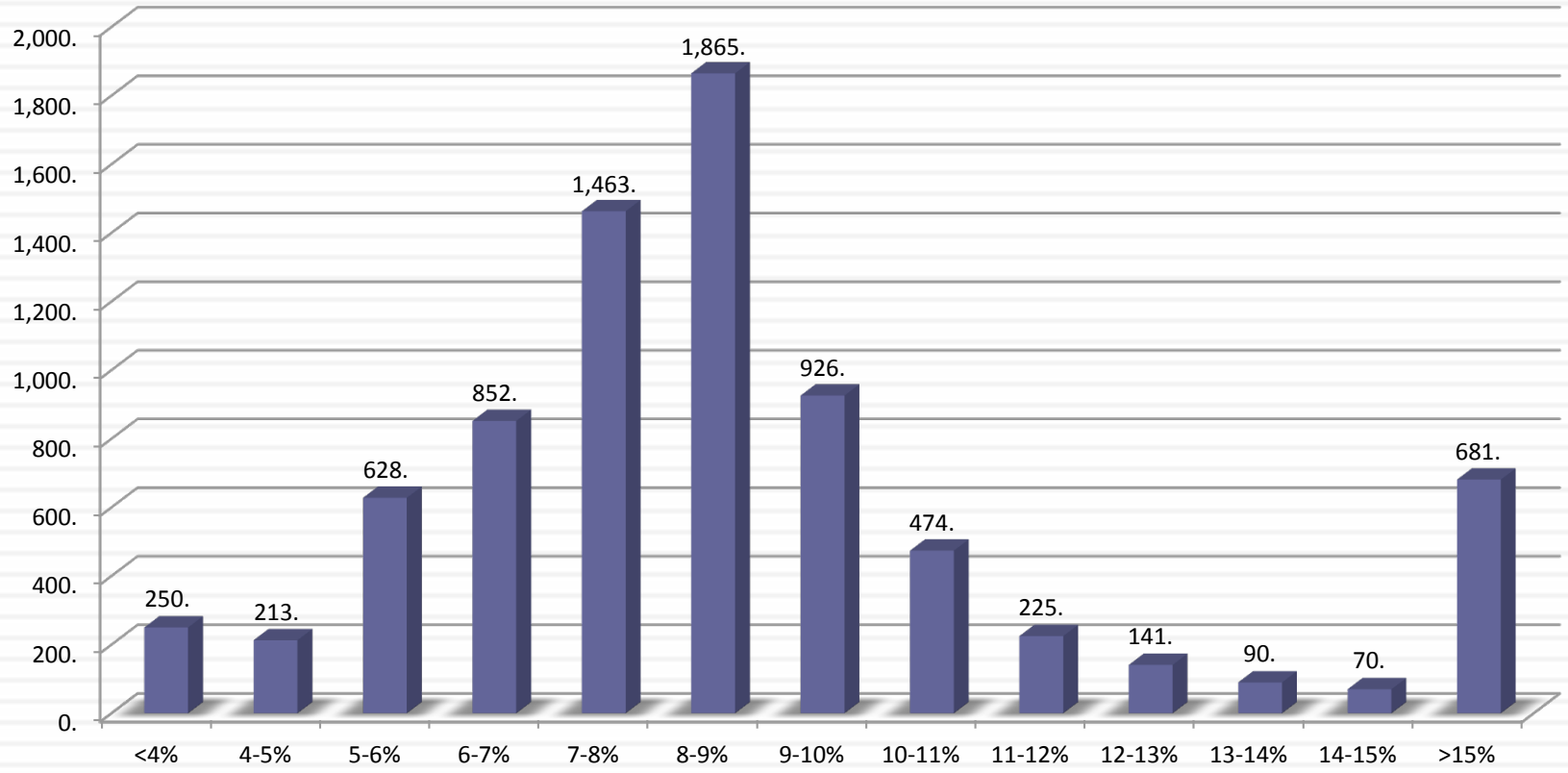
5. Value is about the future, not the past..

	Arithmetic Average		*Geometric Average*	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2014	8.00%	6.25%	6.11%	4.60%
	2.17%	2.32%		
1965-2014	6.19%	4.12%	4.84%	3.14%
	2.42%	2.74%		
2005-2014	7.94%	4.06%	6.18%	2.73%
	6.05%	8.65%		



6. Don’t sweat the small stuff

Cost of equity for Publicly traded US firms - January 2015



The **Chimera DCF** mixes dollar cash flows with peso discount rates, nominal cash flows with real costs of capital and cash flows before debt payments with costs of equity, violating basic consistency rules

In a **Dreamstate DCF**, you build amazing companies on spreadsheets, making outlandish assumptions about growth and operating margins over time.

In a **Dissonant DCF**, assumptions about growth, risk and cash flows are not consistent with each other, with little or no explanation given for the mismatch.

In a **Trojan Horse DCF**, Just as the Greeks used a wooden horse to smuggle soldiers into Troy, analysts use the Trojan Horse of cash flows to smuggle in a pricing (in the form of a terminal value, estimated by using a multiple).

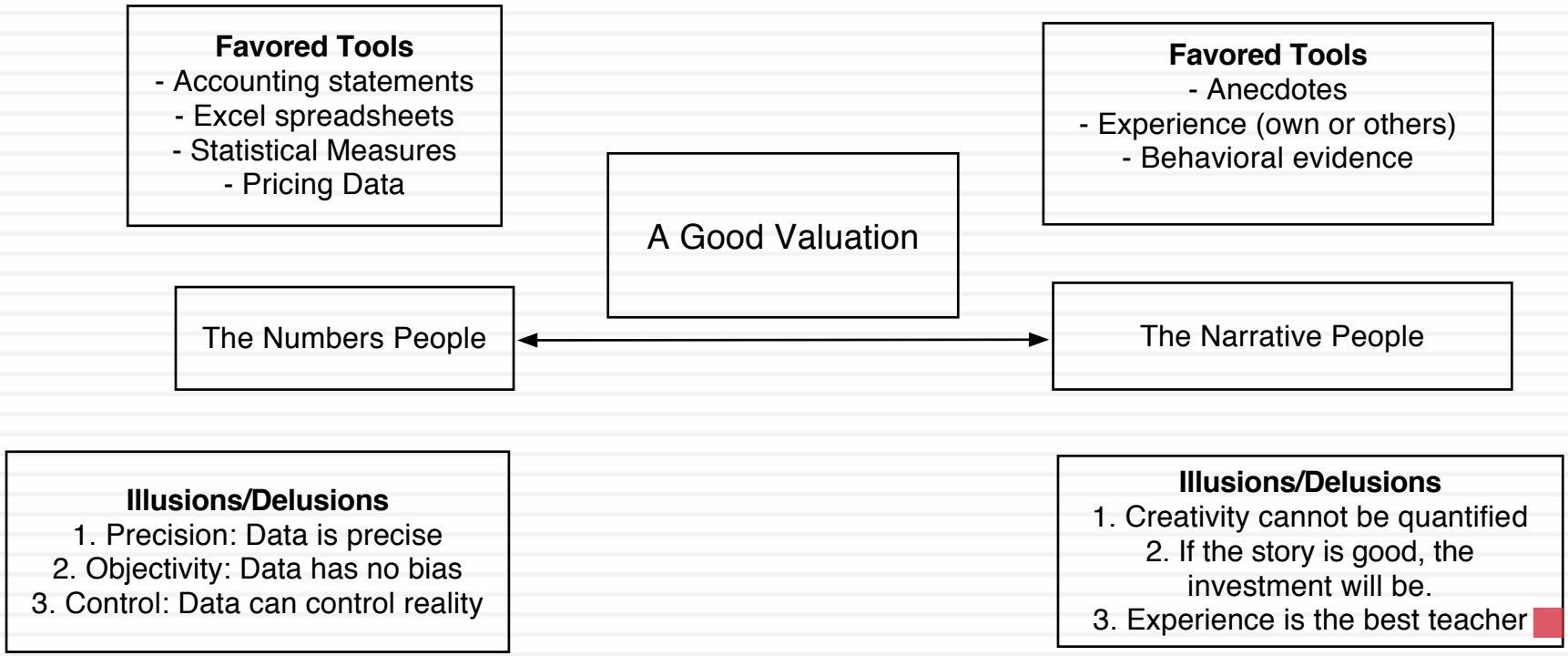
A **Kabuki DCF** is a work of art, where analyst and rule maker (or court) go through the motions of valuation, with the intent of developing models that are legally or accounting-rule defensible rather than yielding reasonable values.

D+CF ≠ DCF

In a **Robo DCF**, the analyst builds a valuation almost entirely from the most recent financial statements and automated forecasts.

A **Mutant DCF** is a collection of numbers where items have familiar names (free cash flow, cost of capital) but the analyst putting it together has neither a narrative nor a sense of the basic principles of

III. Don't mistake modeling for valuation

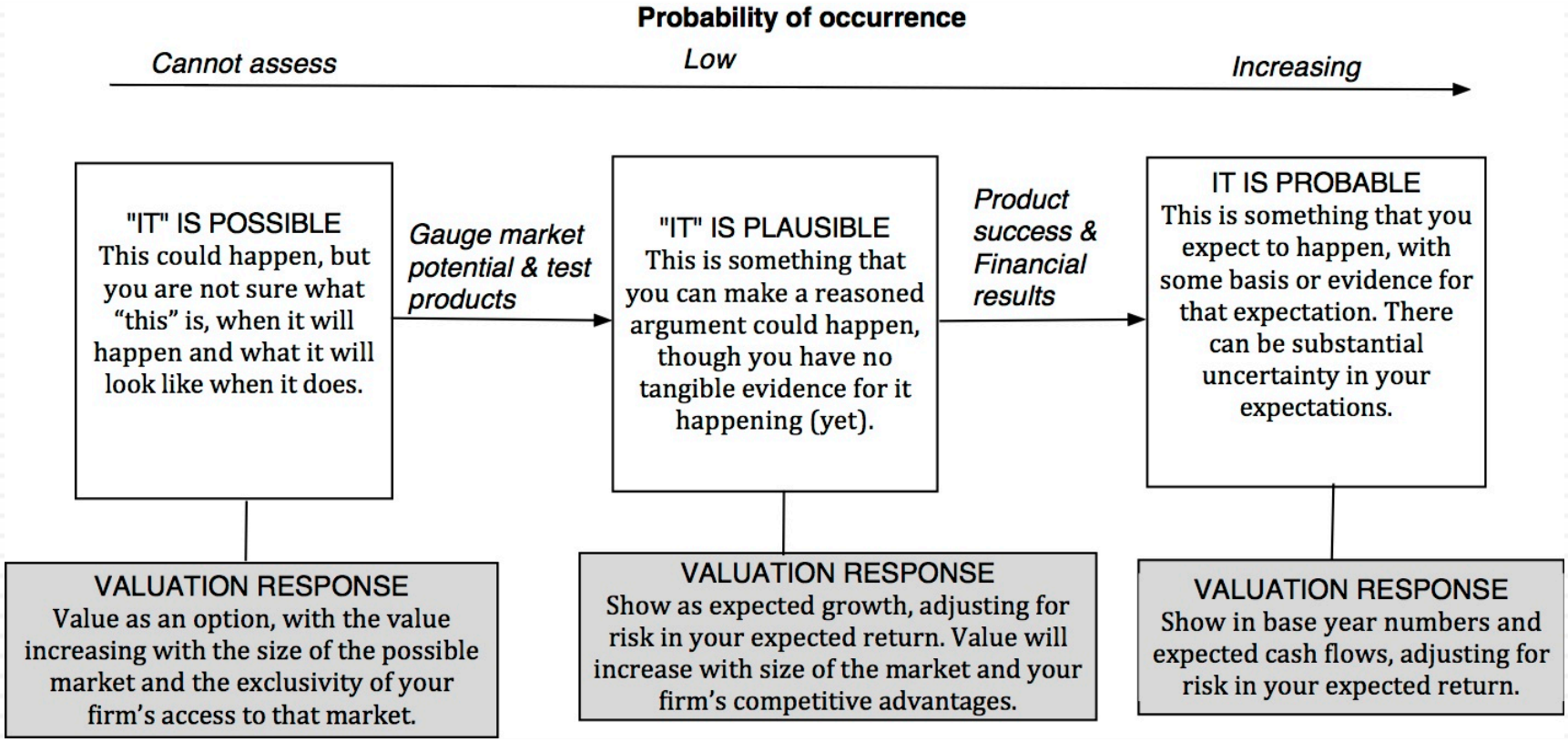


Step 1: Create a narrative

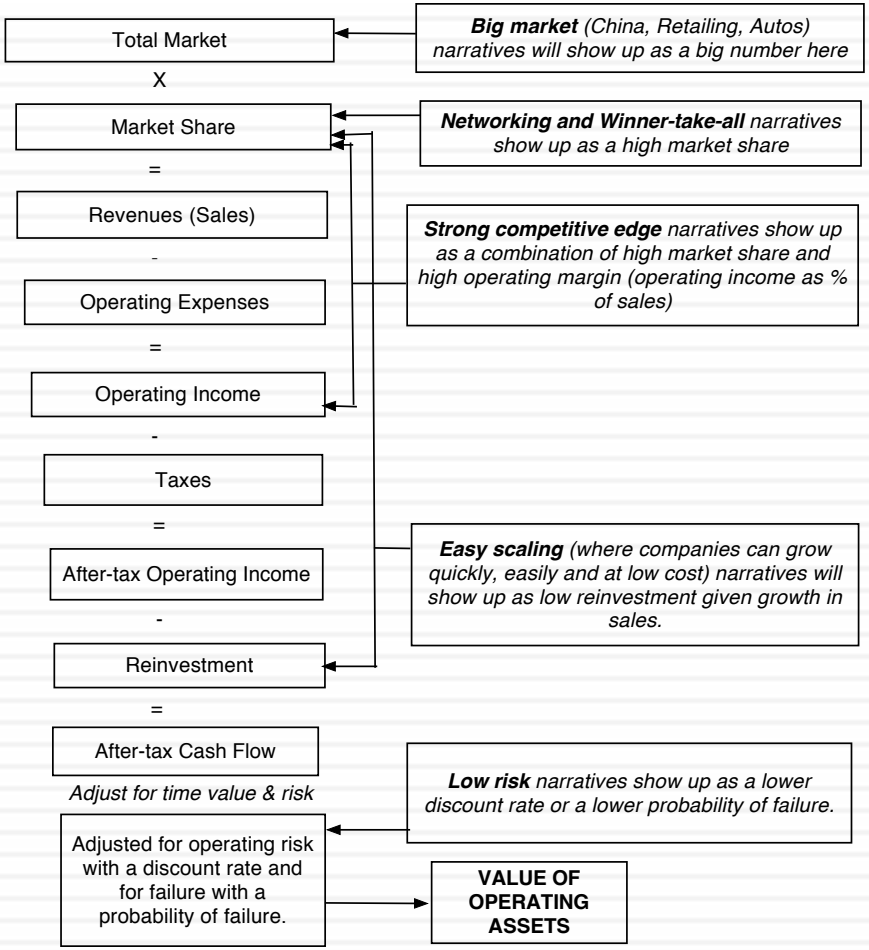
- Every valuation starts with a narrative, a story that you see unfolding for your company in the future.
- In developing this narrative, you will be making assessments of your company (its products, its management), the market or markets that you see it growing in, the competition it faces and will face and the macro environment in which it operates.

My narrative for Uber: 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 profit margins.

Step 2: Check the narrative against history, economic first principles & common sense



Step 3: Connect your narrative to key drivers of value



Step 4: Value the company

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

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

Term yr
EBIT (1-t) $881
- Reinv 88
FCFF $793

Global taxi market is $100 billlion 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 market share of this market will increase to 10% over the next 10 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.

	1	2	3	4	5	6	7	8	9	10
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%	5.22%	6.41%	7.31%	7.98%	8.49%	8.87%	9.15%	9.36%	10.00%
Revenues as percent of gross	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Annual Revenue	$769	$1,173	$1,528	$1,846	$2,137	$2,408	$2,666	$2,916	$3,163	$3,582
Operating margin	7.00%	10.67%	14.33%	18.00%	21.67%	25.33%	29.00%	32.67%	36.33%	40.00%
Operating Income	$54	$125	$219	$332	$463	$610	$773	$953	$1,149	$1,433
Effective tax rate	31%	32%	33%	34%	35%	36%	37%	38%	39%	40%
- Taxes	$17	$40	$72	$113	$162	$220	$286	$362	$448	$573
After-tax operating income	$37	$85	$147	$219	$301	$390	$487	$591	$701	$860
Sales/Capital Ratio	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
- Reinvestment	$94	$81	$71	$64	$58	$54	$52	$50	$49	$84
Free Cash Flow to the Firm	-$57	$4	$76	$156	$243	$336	$435	$541	$652	$776

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.

Value of operating assets = $6,595

Adust for probability of failure (10%)
Expected value = $6,595 (.9) = $5,895

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.

Step 5: Keep the feedback loop

	Uber (Gurley)	*Uber (Gurley Mod)*	*Uber (Damodaran)*
Narrative	Uber will expand the car service market substantially, bringing in mass transit users & 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%.	Uber will expand the car service market substantially, bringing in mass transit users & 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%).	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%.
Total Market	$300 billion, growing at 3% a year	$300 billion, growing at 3% a year	$100 billion, growing at 6% a year
Market Share	40%	40%	10%
Uber's revenue slice	20%	10%	20%
Value for Uber	$53.4 billion + Option value of entering car ownership market ($10 billion+)	$28.7 billion + Option value of entering car ownership market ($6 billion+)	$5.9 billion + Option value of entering car ownership market ($2-3 billion)

Step 6: Be ready to modify narrative as events unfold

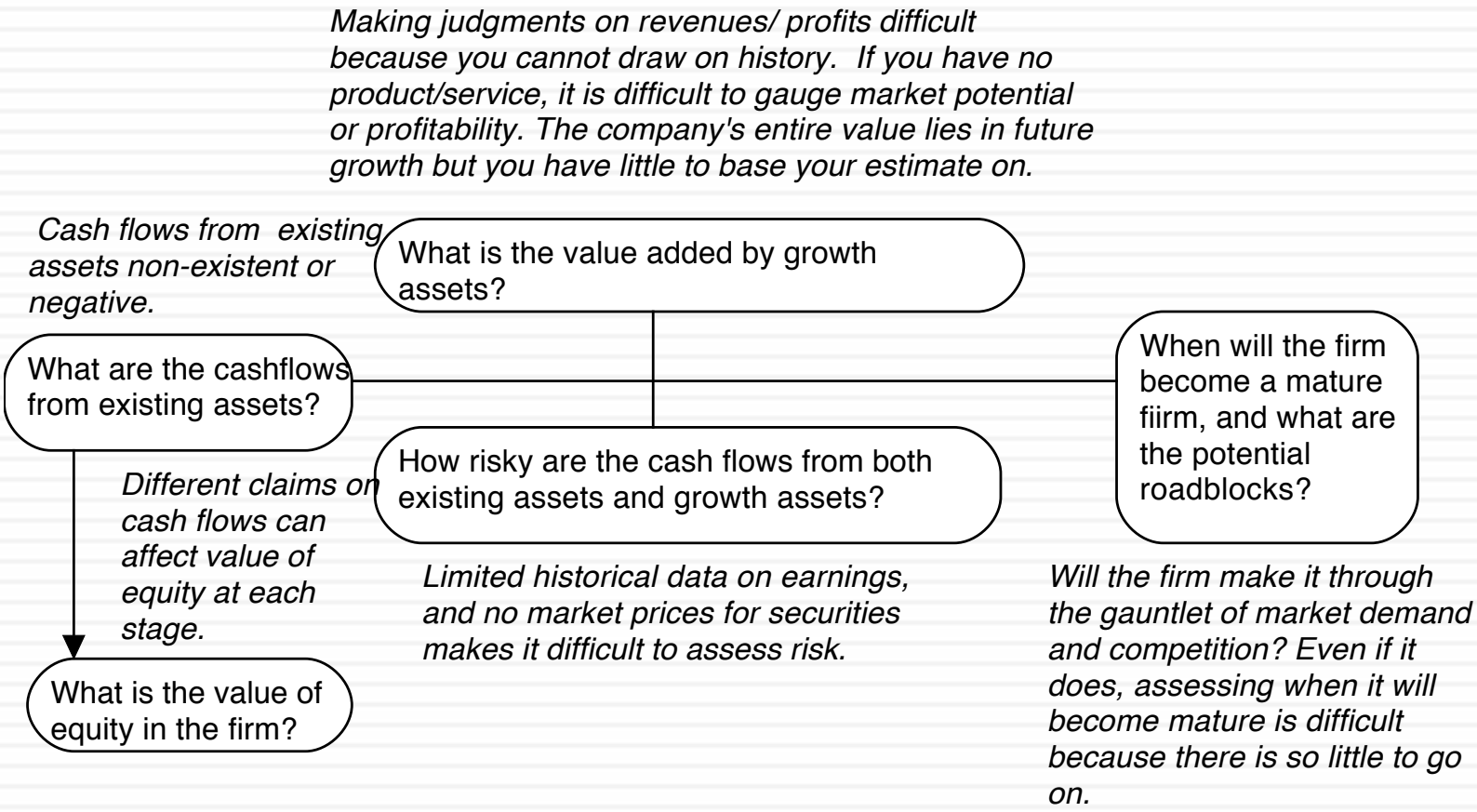
Narrative Break/End	Narrative Shift	Narrative Change (Expansion or Contraction)
Events, external (legal, political or economic) or internal (management, competitive, default), that can cause the narrative to break or end.	Improvement or deterioration in initial business model, changing market size, market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

IV. Don't mistake precision for quality..

- It is natural, especially if you work with numbers, to assume that precision and quality go hand in hand, i.e., that more precise valuations are both better and more useful than less precise ones.
- It is this principle that leads old time value investors to argue that you are better served valuing mature companies, with established business models, than young start-ups and that valuation makes more sense in stable economic environments than during periods of macro economic crisis.
- The ironic truth is that valuation is most useful when it is least precise and why you face the most uncertainty.

Valuing a start up is hard to do..

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



And the dark side will beckon..

- With young start up companies, you will be told that it is "too difficult" or even "impossible" to value these companies, because there is so little history and so much uncertainty in the future.
- Instead, you will be asked to come over to the "dark side", where
  - You will see value metrics that you have never seen before
  - You will hear "macro" stories, justifying value
  - You will be asked to play the momentum game
- While all of this behavior is understandable, none of it makes the uncertainty go away. You have a choice. You can either hide from uncertainty or face up to it.

Twitter: Setting the table in October 2013

	Last 10K	Trailing 12 month
Revenues	$316.93	$534.46
Operating Income	($77.06)	($134.91)
Adjusted Operating Income		$7.66
Invested Capital		$955.00
Adjusted Operating Margin		1.44%
Sales/ Invested Capital		$0.56

Twitter: Priming the Pump for Valuation

1. Make small revenues into big revenues

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

		Annual growth rate in Global Advertising Spending				
		2.00%	2.50%	3.00%	3.50%	4.00%
Online advertising share of market	20%	$124.78	$131.03	$137.56	$144.39	$151.52
	25%	$155.97	$163.79	$171.95	$180.49	$189.40
	30%	$187.16	$196.54	$206.34	$216.58	$227.28
	35%	$218.36	$229.30	$240.74	$252.68	$265.16
	40%	$249.55	$262.06	$275.13	$288.78	$303.04

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

Company	*Operating Margin*
Google Inc. (NasdaqGS:GOOG)	22.82%
Facebook, Inc. (NasdaqGS:FB)	29.99%
Yahoo! Inc. (NasdaqGS:YHOO)	13.79%
Netlfix	3.16%
Groupon	2.53%
LinkedIn Corporation (NYSE:LNKD)	5.18%
Pandora Media, Inc. (NYSE:P)	-9.13%
Yelp, Inc. (NYSE:YELP)	-6.19%
OpenTable, Inc. (NasdaqGS:OPEN)	24.90%
RetailMeNot	45.40%
Travelzoo Inc. (NasdaqGS:TZOO)	15.66%
Zillow, Inc. (NasdaqGS:Z)	-66.60%
Trulia, Inc. (NYSE:TRLA)	-6.79%
Aggregate	20.40%

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

3. Reinvest for growth

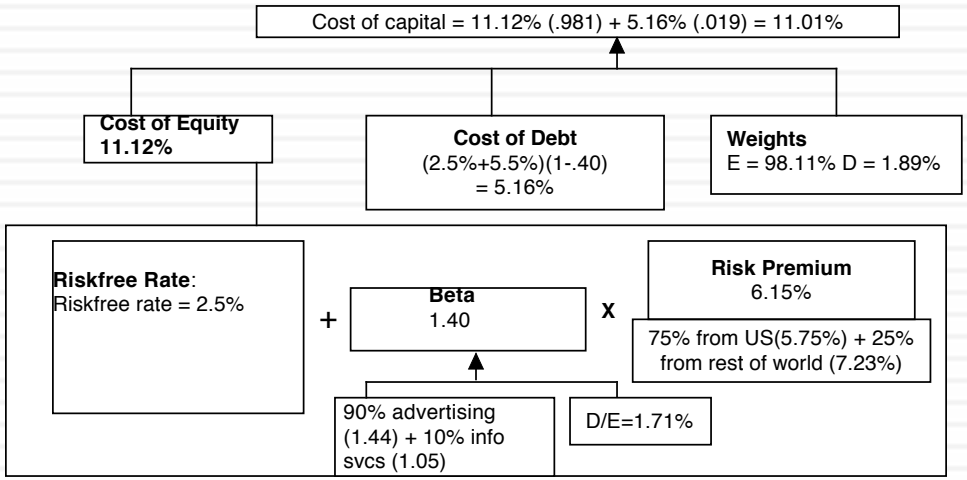
	Sales/ Invested Capital
Twitter (2013)	1.10
Advertising Companies	1.40
Social Media Companies	1.05

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

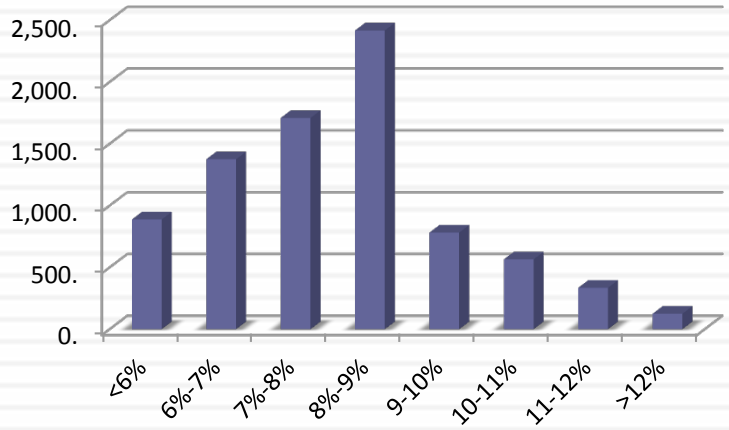
The Cost of Capital for Twitter

Risk in the discount rate

My estimate for Twitter



Cost of Capital: US - Nov '13



0% *Survival Risk* 100%

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

Twitter Pre-IPO Valuation: October 27, 2013

Starting numbers

	Last 10K	Trailing 12 month
Revenues	$316.93	$534.46
Operating income	-$77.06	-$134.91
Adjusted Operating Income		$7.67
Invested Capital		$955.00
Adjusted Operatng Margin		1.44%
Sales/ Invested Capital		0.56
Interest expenses	$2.49	$5.30

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

Stable Growth
g = 2.5%; Beta = 1.00;
Cost of capital = 8%
ROC= **12**%;
Reinvestment Rate=2.5%/12% = 20.83%

Terminal Value$_{10}$= 1466/(.08-.025) = $26,657

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Revenues	$ 810	$1,227	$1,858	$2,816	$4,266	$6,044	$7,973	$9,734	$10,932	$11,205
Operating Income	$ 31	$ 75	$ 158	$ 306	$ 564	$ 941	$1,430	$1,975	$ 2,475	$ 2,801
Operating Income after tax	$ 31	$ 75	$ 158	$ 294	$ 395	$ 649	$ 969	$1,317	$ 1,624	$ 1,807
- Reinvestment	$ 183	$ 278	$ 421	$ 638	$ 967	$1,186	$1,285	$1,175	$ 798	$ 182
FCFF	$(153)	$ (203)	$ (263)	$ (344)	$ (572)	$ (537)	$ (316)	$ 143	$ 826	$ 1,625

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

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

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

Cost of Equity
11.12%

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

Weights
E = 98.1% D = 1.9%

Riskfree Rate:
Riskfree rate = 2.5%

+

Beta
1.40

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

D/E=1.71%

x

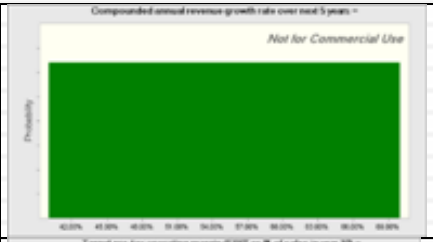
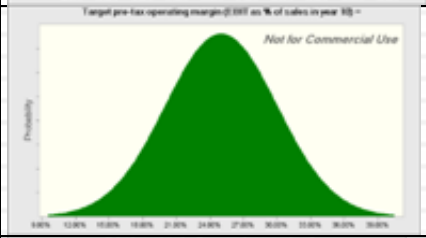
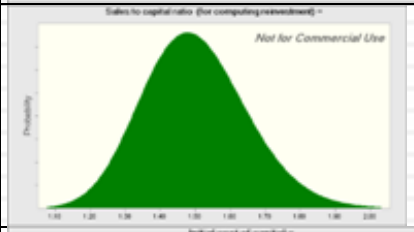
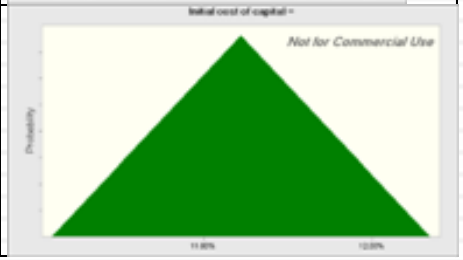
Risk Premium
6.15%

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

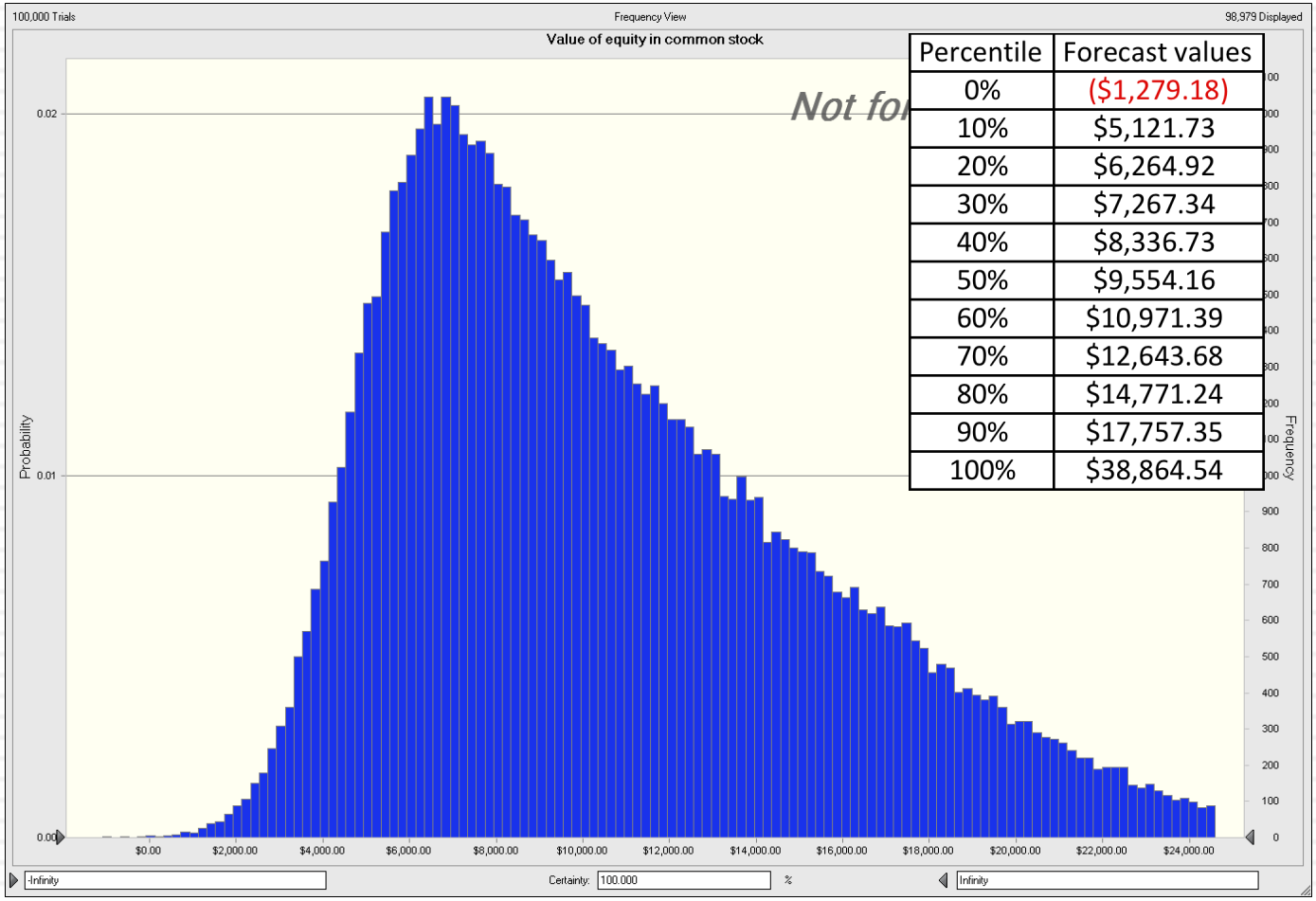
A sobering reminder: You will be "wrong" and it is okay

- No matter how careful you are in getting your inputs and how well structured your model is, your estimate of value will change both as new information comes out about the company, the business and the economy.
- As information comes out, you will have to adjust and adapt your model to reflect the information. Rather than be defensive about the resulting changes in value, recognize that this is the essence of risk.
- Remember that it is not just your value that is changing, but so is the price, and the price will change a great deal more than the value.

To illustrate: Revisiting the Twitter valuation…

Revenue Growth Rate Distribution: Uniform Expected Value = 55% Minimum Value: 40% Maximum Value: 70%	
Target Operating Margin Distribution: Normal Expected Value = 25% Standard Deviation = 5%	
Sales to Capital Ratio Distribution: Lognormal Expected value: 1.50 Standard deviation: 0.15	
Cost of Capital Distribution: Triangular Expected value: 11.22% Minimum value: 10.02% Maximum value: 12.22%	

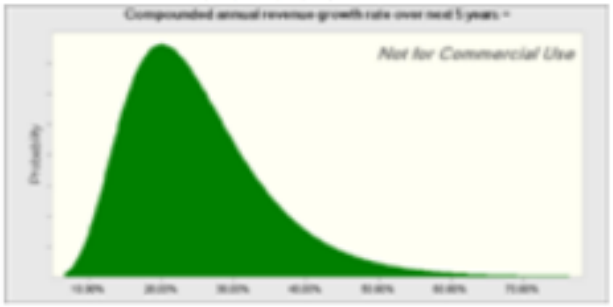
With the consequences for equity value…



Percentile	Forecast values
0%	($1,279.18)
10%	$5,121.73
20%	$6,264.92
30%	$7,267.34
40%	$8,336.73
50%	$9,554.16
60%	$10,971.39
70%	$12,643.68
80%	$14,771.24
90%	$17,757.35
100%	$38,864.54

Alibaba: Key Inputs

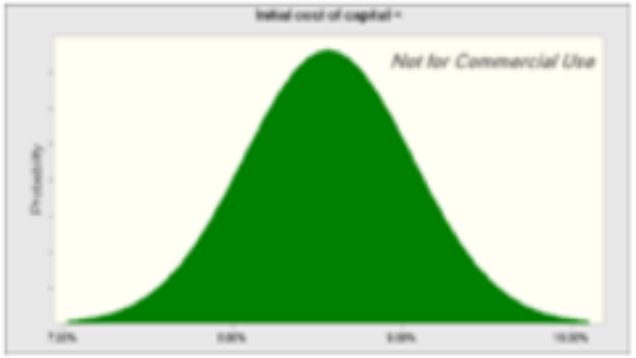
Revenue Growth



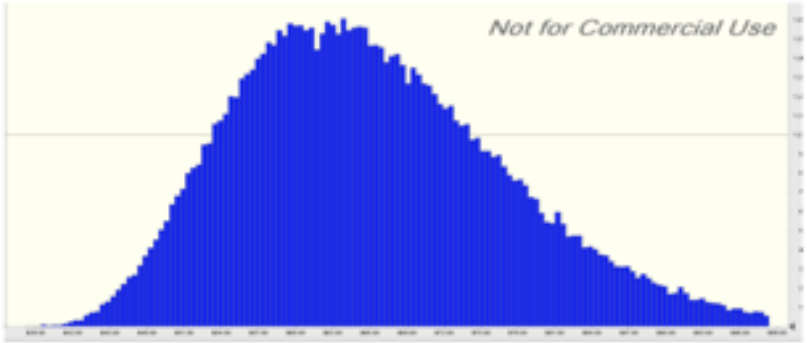
Pre-tax operating margin

Sales to Capital Ratio

Cost of capital



Alibaba: Value Distribution



Percentile	Forecast values
0%	$38.11
10%	$52.96
20%	$56.64
30%	$59.58
40%	$62.39
50%	$65.15
60%	$68.10
70%	$71.43
80%	$75.54
90%	$81.60
100%	$153.10

Mean = $66.45; Median = $65.15; Lowest value = $38.11; Highest value = $153.10

Forecasting in the face of uncertainty. A test:

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

Weather changeability for Honolulu, Hawaii

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	1.7°	1.2°
Average change in low temperature day-to-day	1.5°	2.0°

Precipitation	Last Month	Last Year
Chance of dry day after a precip day	67%	81%
Chance of precip day after a dry day	7%	13%

Weather changeability for Epping, North Dakota

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	8.5°	7.7°
Average change in low temperature day-to-day	7.1°	8.6°

Precipitation	Last Month	Last Year
Chance of dry day after a precip day	50%	65%
Chance of precip day after a dry day	38%	20%

But the payoff is greatest where there is the most uncertainty…

41

Weather changeability for Honolulu, Hawaii

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	1.7°	1.2°
Average change in low temperature day-to-day	1.5°	2.0°

Precipitation	Last Month	Last Year
Chance of dry day after a precip day	67%	81%
Chance of precip day after a dry day	7%	13%

Further changeability analysis »

Weather forecast accuracy for Honolulu, Hawaii

Last Month	
MeteoGroup	**88.44%**
Persistence	**81.80%**
CustomWeather	**78.23%**
The Weather Channel	73.12%
AccuWeather	69.89%
Weather Underground	62.10%
National Weather Service	48.39%
Foreca	44.35%
WeatherBug	32.26%

Last Year	
MeteoGroup	**88.50%**
CustomWeather	**85.87%**
AccuWeather	**81.82%**
The Weather Channel	81.56%
Persistence	80.44%
Weather Underground	67.07%
National Weather Service	59.90%
Foreca	57.52%
WeatherBug	37.09%

Weather changeability for Epping, North Dakota

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	8.5°	7.7°
Average change in low temperature day-to-day	7.1°	8.6°

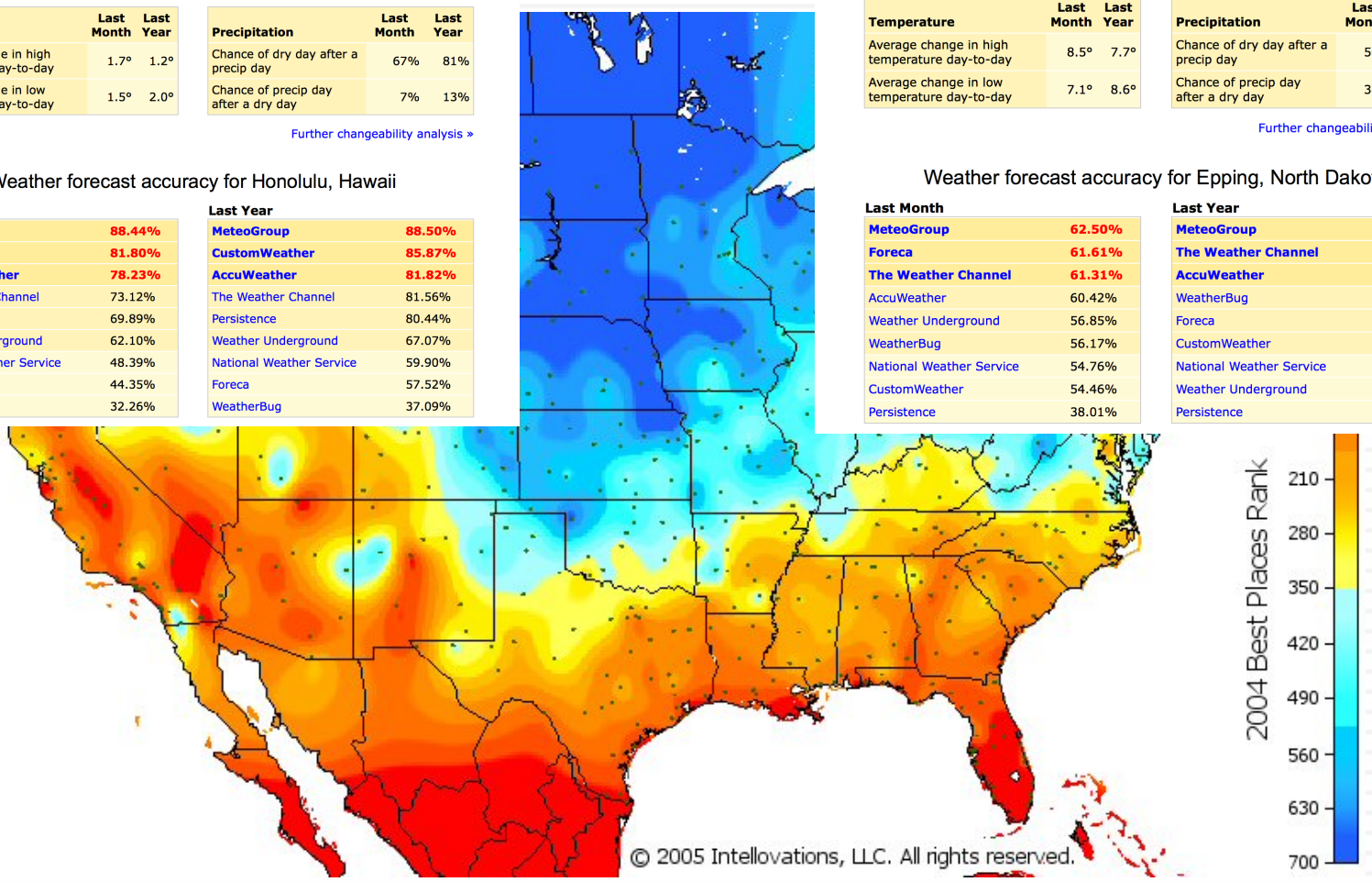
Precipitation	Last Month	Last Year
Chance of dry day after a precip day	50%	65%
Chance of precip day after a dry day	38%	20%

Further changeability analysis »

Weather forecast accuracy for Epping, North Dakota

Last Month	
MeteoGroup	**62.50%**
Foreca	**61.61%**
The Weather Channel	**61.31%**
AccuWeather	60.42%
Weather Underground	56.85%
WeatherBug	56.17%
National Weather Service	54.76%
CustomWeather	54.46%
Persistence	38.01%

Last Year	
MeteoGroup	**66.97%**
The Weather Channel	**66.73%**
AccuWeather	**64.86%**
WeatherBug	64.80%
Foreca	62.75%
CustomWeather	62.70%
National Weather Service	62.64%
Weather Underground	61.38%
Persistence	44.09%



V. Don’t mistake price for value!

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

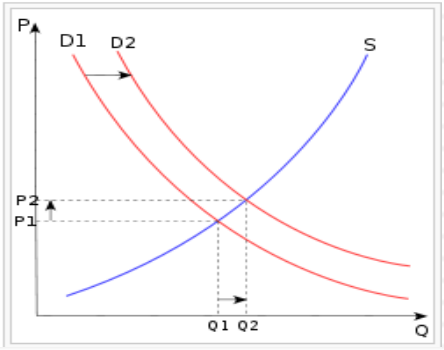
INTRINSIC VALUE

Value

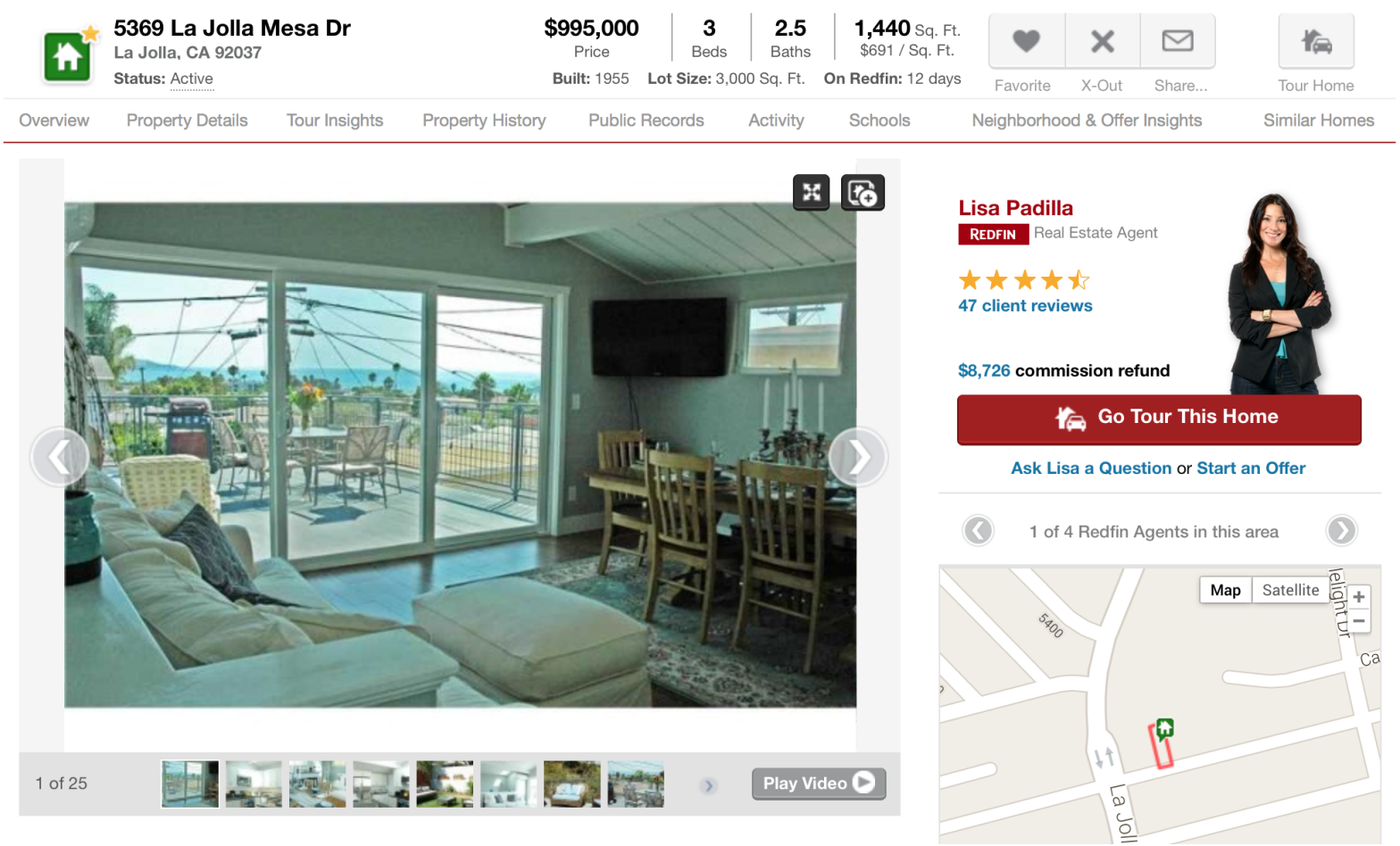
THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Price

PRICE



Test 1: Are you pricing or valuing?



Test 2: Are you pricing or valuing?

44

Europe
Switzerland

Biotechnology
Biotechnology

Reuters	Bloomberg	Exchange	Ticker
BION.S	BION SW	SWX	BION

Price at 12 Aug 2013 (CHF)	124.00
Price Target (CHF)	164.50
52-week range (CHF)	128.40 - 84.90

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, BBB 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

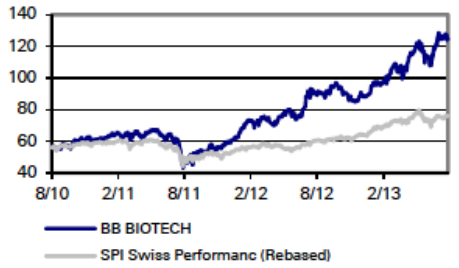
With the re-rating of the pharma sector, investors have also showed increased interest in biotech stocks. Established biotech stocks have delivered encouraging financial results and approvals, while there has also been substantial industry consolidation, which is not surprising in times of "cheap" money 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

Key changes

Target Price	106.50 to 164.50	↑	54.5%

Source: Deutsche Bank

Price/price relative



Performance (%)	1m	3m	12m
Absolute	-1.4	5.4	37.4

Test 3: Are you pricing or valuing?

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

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).

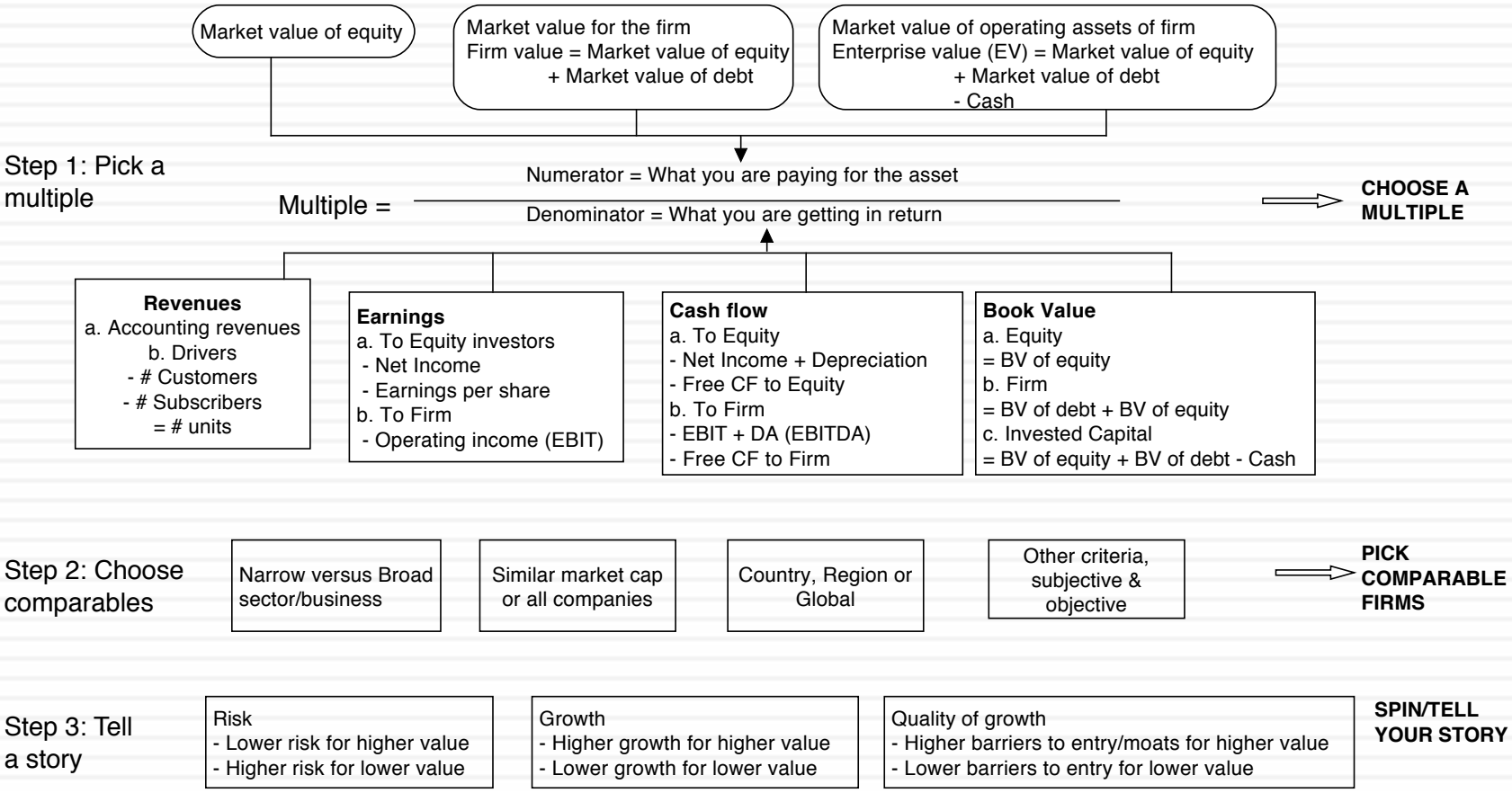
Liquidity & Trading Ease
While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

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".

Multiples and Comparable Transactions



To be a better pricer, here are four suggestions

- Check your multiple or consistency/uniformity
  - In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated
- Look at all the data, not just the key statistics
  - Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.
- Don't forget the fundamentals ultimately matter
  - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- Don't define comparables based only on sector
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

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- Don't define comparables based only on sector
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

1. Check the Multiple

- Is the multiple consistently defined?
  - The consistency principle: 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.
  - The cost of mismatching: Assets that are not cheap(expensive) will look cheap (expensive), because your mismatch will skew the numbers.
- Is the multiple uniformly estimated?
  - The uniformity rule: The variables used in defining the multiple should be estimated uniformly across assets in the "comparable firm" list.
  - The cost of ignoring this rule: You will be comparing non-comparable numbers and drawing all the wrong conclusions.

Let's try these definitional rules: PE ratio

PE = Market Price per Share / Earnings per Share

- There are a number of variants on the basic PE ratio in use. They are based upon how the price and the earnings are defined.

Price: is usually the current price

is sometimes the average price for the year

EPS: EPS in most recent financial year

EPS in trailing 12 months (Trailing PE)

Forecasted EPS in next year (Forward PE)

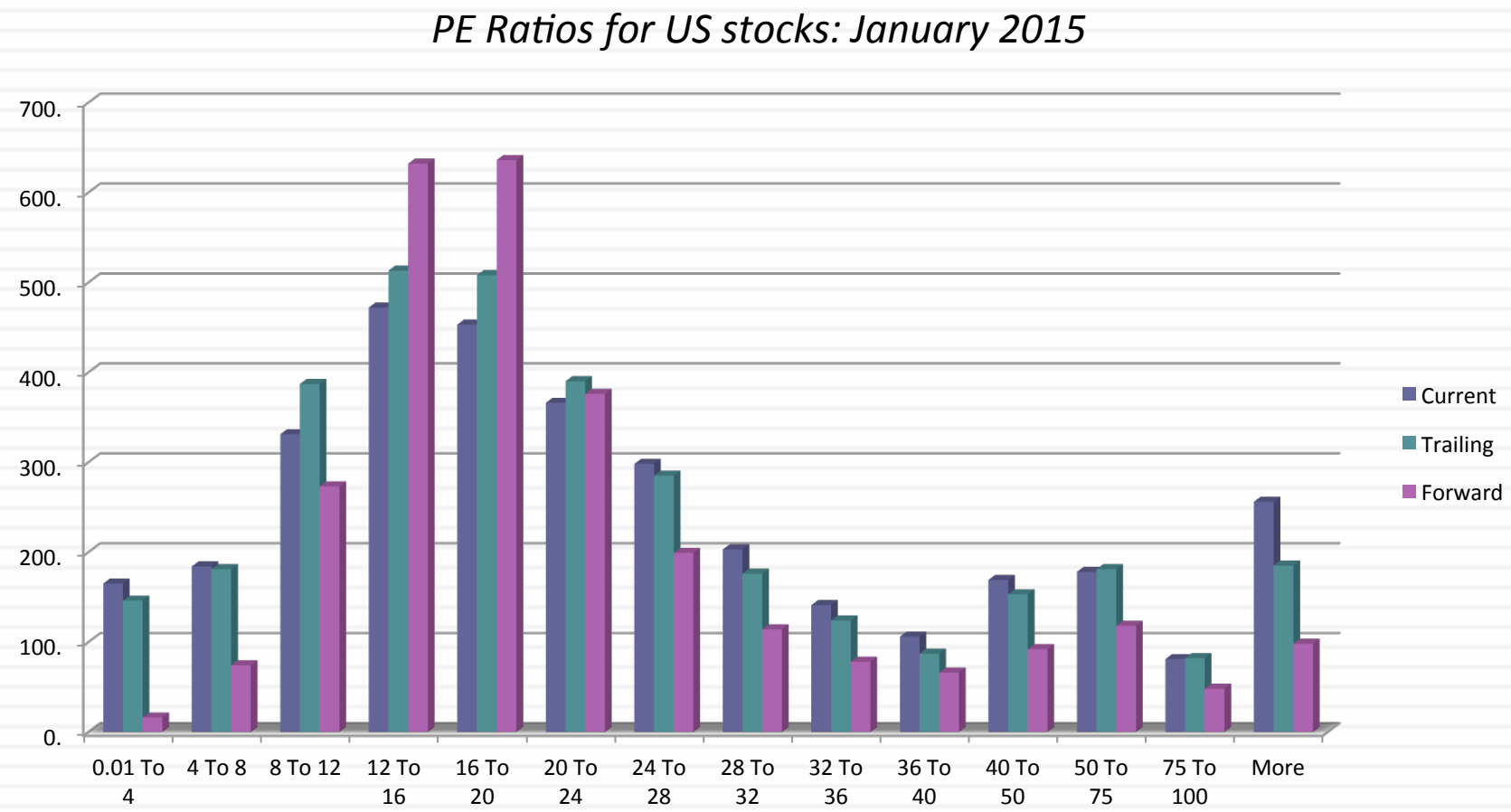
Forecasted EPS in future year

- Even though PE ratios are consistent at their most general level, there are sub-level consistency tests that you have to meet including:
  - Should you use primary, diluted or partially diluted earnings per share?
  - What do you do about cash balances at companies and the effects they have on market capitalization and earnings?

2. Play Moneyball: Let the numbers talk (not the analysts)

- What is the average and standard deviation for this multiple, across the universe (market)?
- What is the median for this multiple?
  - The median for this multiple is often a more reliable comparison point.
- How large are the outliers to the distribution, and how do we deal with the outliers?
  - Throwing out the outliers may seem like an obvious solution, but if the outliers all lie on one side of the distribution (they usually are large positive numbers), this can lead to a biased estimate.
- Are there cases where the multiple cannot be estimated? Will ignoring these cases lead to a biased estimate of the multiple?
- How has this multiple changed over time?

Multiples have skewed distributions…



Making statistics "dicey"

	Current PE	*Trailing PE*	*Forward PE*
Number of firms	*7887*	*7887*	*7887*
Number with PE	3403	3398	2820
Average	72.13	60.49	35.25
Median	20.88	19.74	18.32
Minimum	0.25	0.4	1.15
Maximum	23,100.	23,100.	5,230.91
Standard deviation	509.6	510.41	139.75
Standard error	8.74	8.76	2.63
Skewness	31.	32.77	25.04
25th percentile	13.578	13.2	14.32
75th percentile	33.86	31.16	25.66

3. Understand your "implicit" assumptions

- What are the fundamentals that determine and drive these multiples?
  - Proposition 1: Embedded in every multiple are all of the variables that drive every discounted cash flow valuation - growth, risk and cash flow patterns.
  - In fact, using a simple discounted cash flow model and basic algebra should yield the fundamentals that drive a multiple
- How do changes in these fundamentals change the multiple?
  - The relationship between a fundamental (like growth) and a multiple (such as PE) is seldom linear. For example, if firm A has twice the growth rate of firm B, it will generally not trade at twice its PE ratio
  - Proposition 2: It is impossible to properly compare firms on a multiple, if we do not know the nature of the relationship between fundamentals and the multiple.

PE Ratio: Understanding the Fundamentals

Equity Multiple or Firm Multiple

Equity Multiple

1. Start with an equity DCF model (a dividend or FCFE model)

$$P_0 = \frac{DPS_1}{r - g_n} \qquad P_0 = \frac{FCFE_1}{\text{Cost of equity} - g_n}$$

2. Isolate the denominator of the multiple in the model
3. Do the algebra to arrive at the equation for the multiple

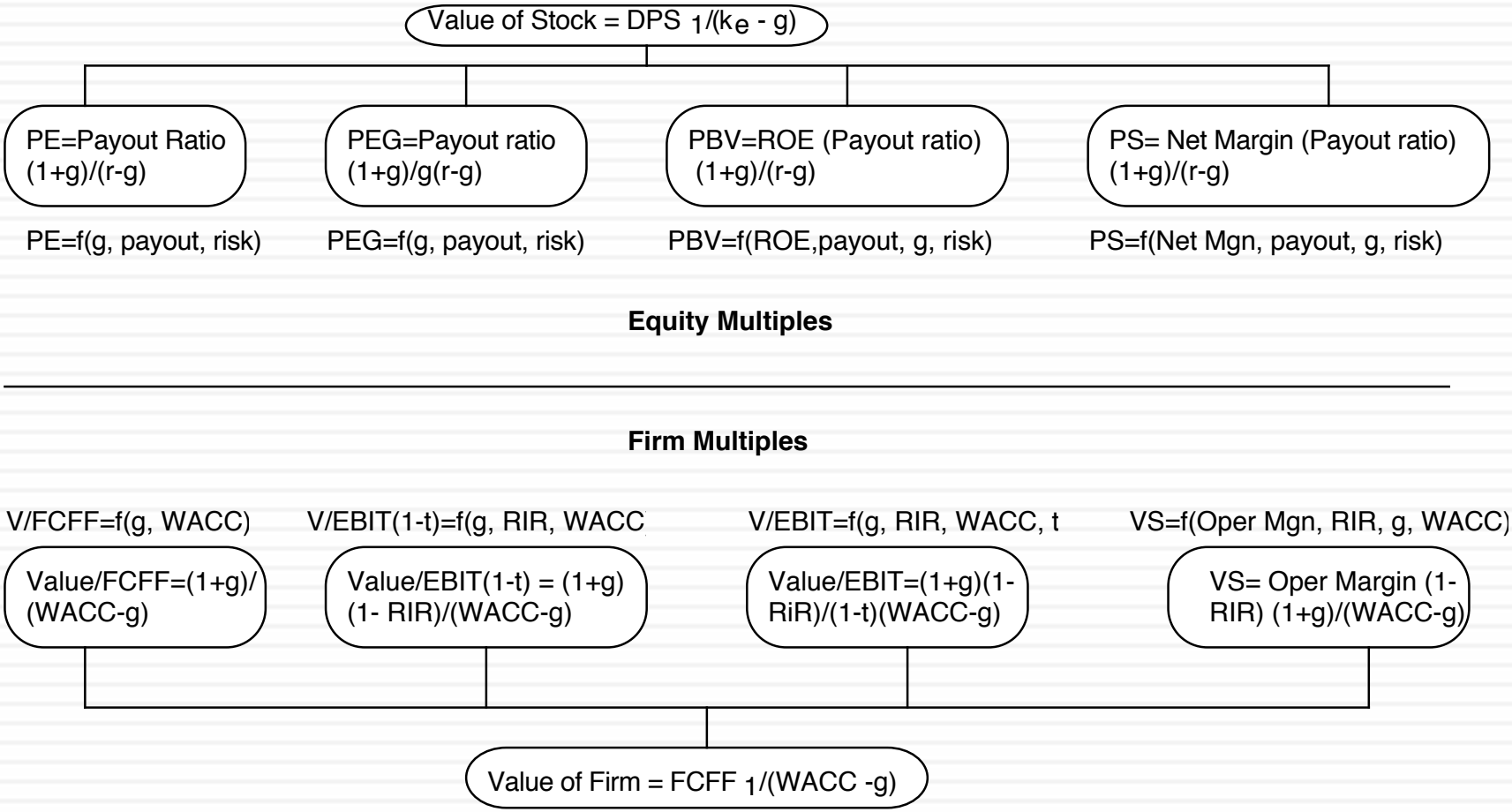
Firm Multiple

1. Start with a firm DCF model (a FCFF model)

$$EV_0 = \frac{FCFF_1}{\text{Cost of capital} - g_n}$$

2. Isolate the denominator of the multiple in the model
3. Do the algebra to arrive at the equation for the multiple

The Determinants of Multiples…



4. Define "comparable" broadly & control for differences

- Given the firm that we are valuing, what is a "comparable" firm?
  - While traditional analysis is built on the premise that firms in the same sector are comparable firms, valuation theory would suggest that a comparable firm is one which is similar to the one being analyzed in terms of fundamentals.
  - Proposition 4: There is no reason why a firm cannot be compared with another firm in a very different business, if the two firms have the same risk, growth and cash flow characteristics.
- Given the comparable firms, how do we adjust for differences across firms on the fundamentals?
  - Proposition 5: It is impossible to find an exactly identical firm to the one you are valuing.

Pricing Twitter: Start with the "comparables"

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

	Market Cap	Enterprise value	Revenues	EBITDA	Net Income	Number of users (millions)
Market Cap	1.					
Enterprise value	0.9998	1.				
Revenues	0.8933	0.8966	1.			
EBITDA	0.9709	0.9701	0.8869	1.		
Net Income	0.8978	0.8971	0.8466	0.9716	1.	
Number of users (millions)	0.9812	0.9789	0.8053	0.9354	0.8453	1.

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

Use the "market metric" and "market price"

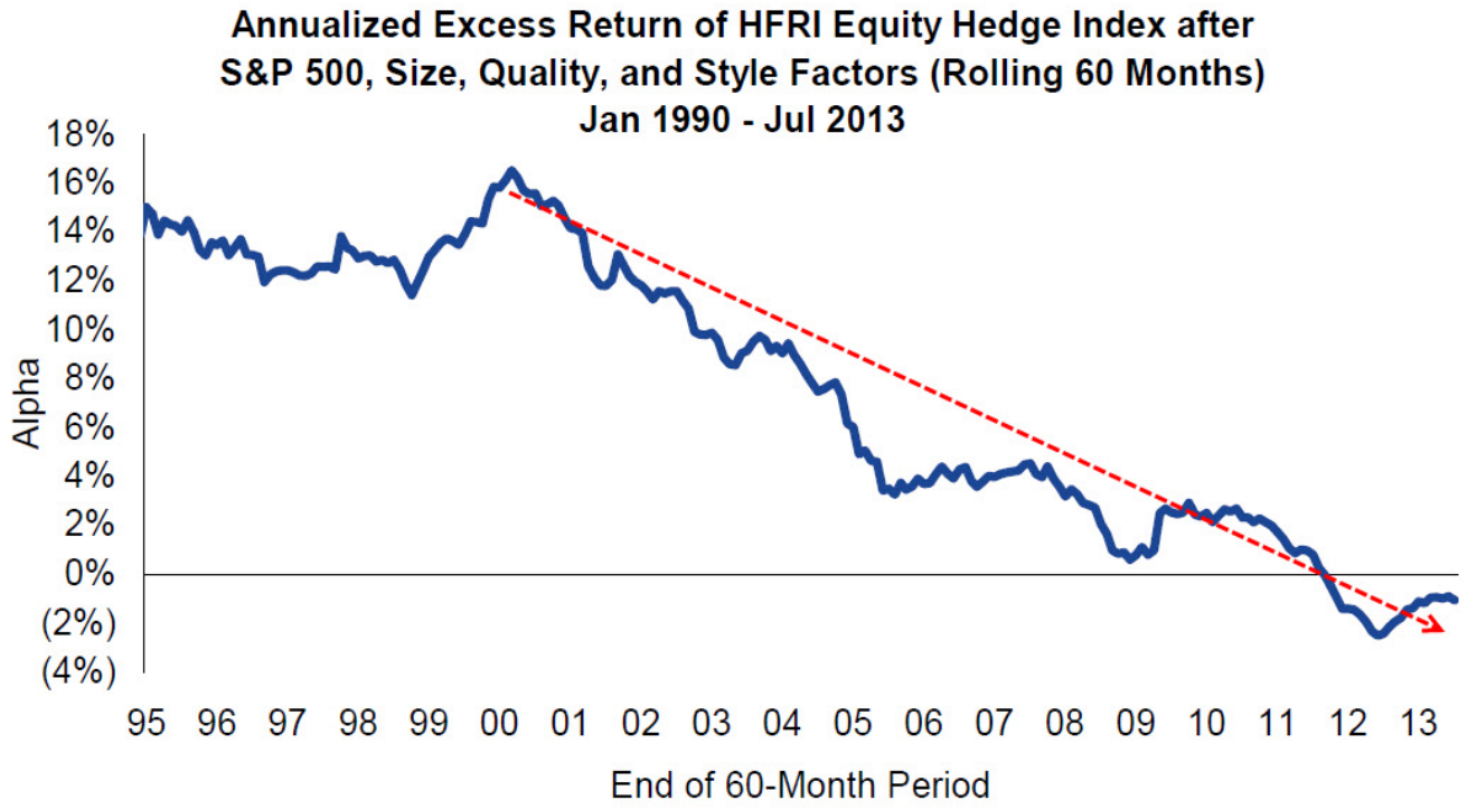
- The most important variable, in late 2013, in determining market value and price in this sector (social media, ill defined as that is) is the number of users that a company has.
- Looking at comparable firms, it looks like the market is paying about $100/user in valuing social media companies, with 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

VI. Don't mistake luck for skill!

TOP-PERFORMING LARGE HEDGE FUNDS

	Fund, *Manager(s)*	Management Firm, Location	Strategy	ASSETS, IN BILLIONS	YTD TOTAL RETURN*	2012 RETURN
1	Glenview Capital Opportunity, *Larry Robbins*	Glenview Capital Management, U.S.	Long/short	$1.8	84.2%	54.3%
2	Matrix Capital Management, *David Goel*	Matrix Capital Management, U.S.	Long/short	1.6	56.0	20.0
3	Paulson Recovery, *John Paulson*	Paulson & Co., U.S.	Long equity	2.4	45.0	4.9
4	Lansdowne Developed Markets SIF *Stuart Roden, Peter Davies, Jonathon Regis*	Lansdowne Partners, U.K.	Long biased	1.5	44.5	34.5
5	The Children's Investment, *Christopher Hohn*	The Children's Investment Fund Mgmt., U.K.	Activist	7.3	39.7	30.0
6	Owl Creek Overseas, *Jeffrey Altman, Daniel Krueger, Jeffrey Lee*	Owl Creek Asset Management, U.S.	Event driven/multistrategy	3.2	38.1	11.1
7	Glenview Capital Partners, *Larry Robbins*	Glenview Capital Management, U.S.	Long/short	3.2	37.4	24.2
8	Trian Partners, *Nelson Peltz, Peter May, Ed Garden*	Trian Fund Management, U.S.	Activist	7.8	34.9	0.9
9	Palomino, *David Tepper*	Appaloosa Management, U.S.	Opportunistic	7.3	31.5	29.3
10	Pelham Long/Short, *Ross Turner*	Pelham Capital Management, U.K.	Long/short	3.2	30.3	18.4

But here is the big picture



The Impossible Quest: Searching for "smart" money

- We are constantly told that there is "smart" money out there, i.e., investors who have figured out ways to beat the market consistently.
  - Can you name one category of investors that you would list as "smart" money?
  - Can you name individual investors that you would call "smart" money"
- It is every active investor's dream to be one of the "smart money" group. What do you need to bring to the game to have a good chance of succeeding?
  a. Lots of money to invest
  b. Smarts (High IQ, College Pedigree)
  c. Information access (Better data, More data, Proprietary data)
  d. Information processing (Better models, Bigger computers)
  e. Trading platform (High speed trading)
  f. Something else (What?)

And the final lesson..