VALUATION: NOT JUST ABOUT THE NUMBERS

Sao Paulo, Brazil
July 1, 2015

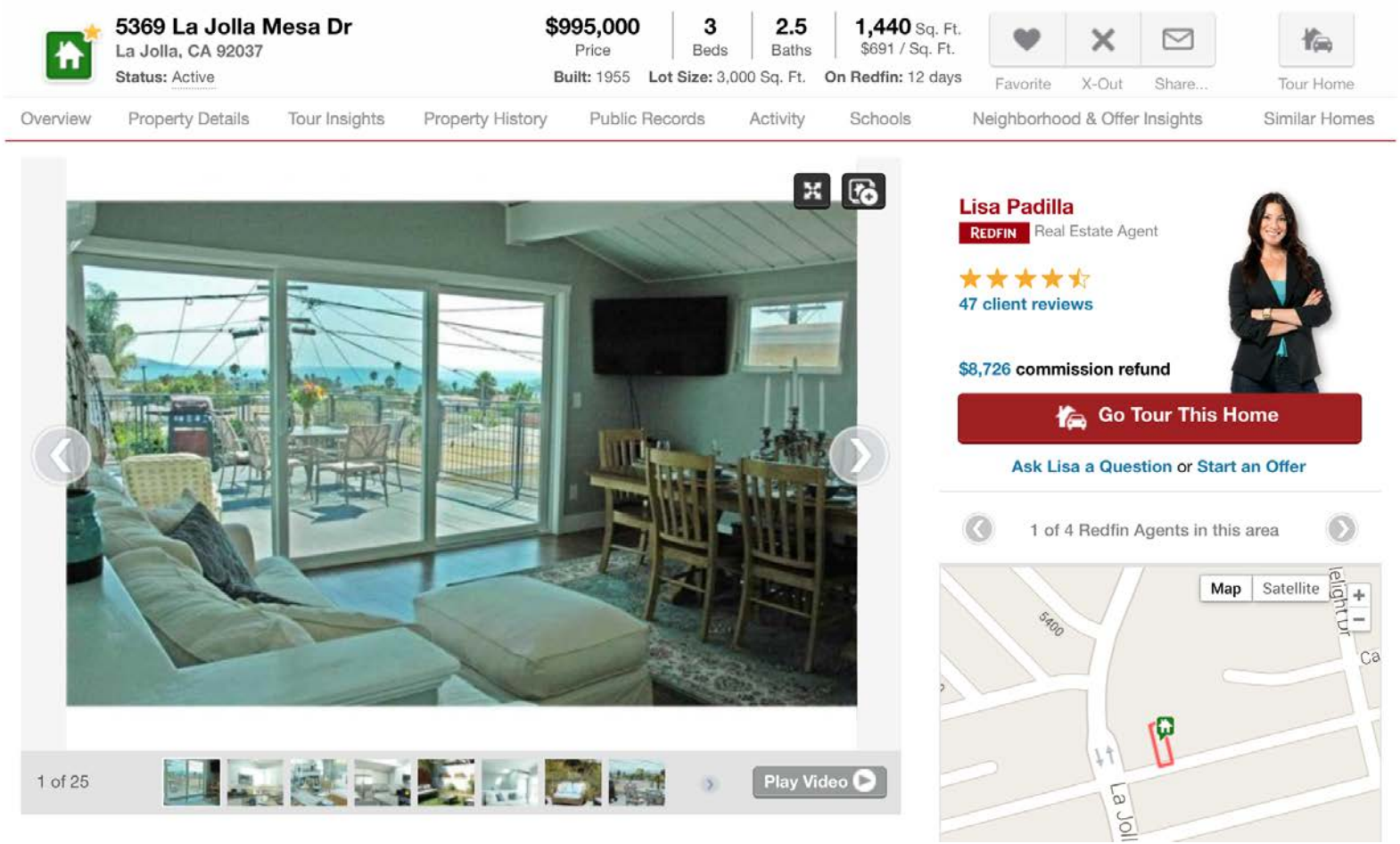
The two sub-parts to the session

- When doing valuation, we often get caught up in the numbers (how to estimate cash flows, arrive at cost of capital, deal with growth etc.) and forget to step back, for perspective.
- In today's session, I would like to elevate and take a look at what I think are two key components of valuation:
  - The contrast between valuing an asset and pricing it, what drives the two, the tools we use for each and why the numbers can deviate.
  - The connection between narrative and numbers, i.e., how every good valuation should tell a story (and if you buy into the valuation, you are also buying into the story)

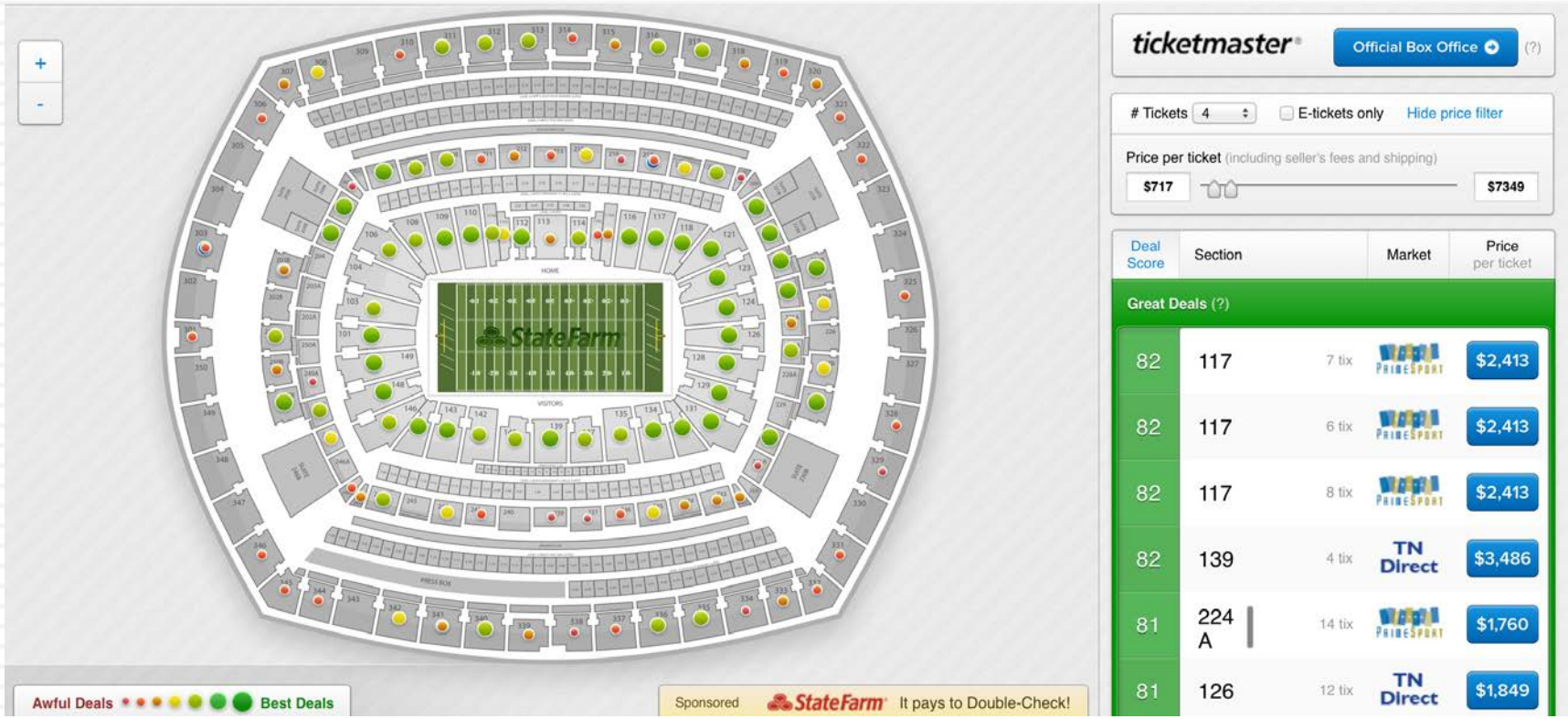
PRICE AND VALUE: DISCERNING THE DIFFERENCE

Aswath Damodaran

Test 1: Are you pricing or valuing?



Test 2: Are you pricing or valuing?



Test 3: Are you pricing or valuing?

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

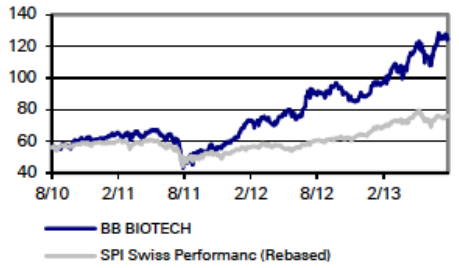
With the re-rating of the pharma sector, investors have also showed increased interest in biotech stocks. Established biotech stocks have delivered encouraging financial results and approvals, while there has also been substantial industry consolidation, which is not surprising in times of "cheap" money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

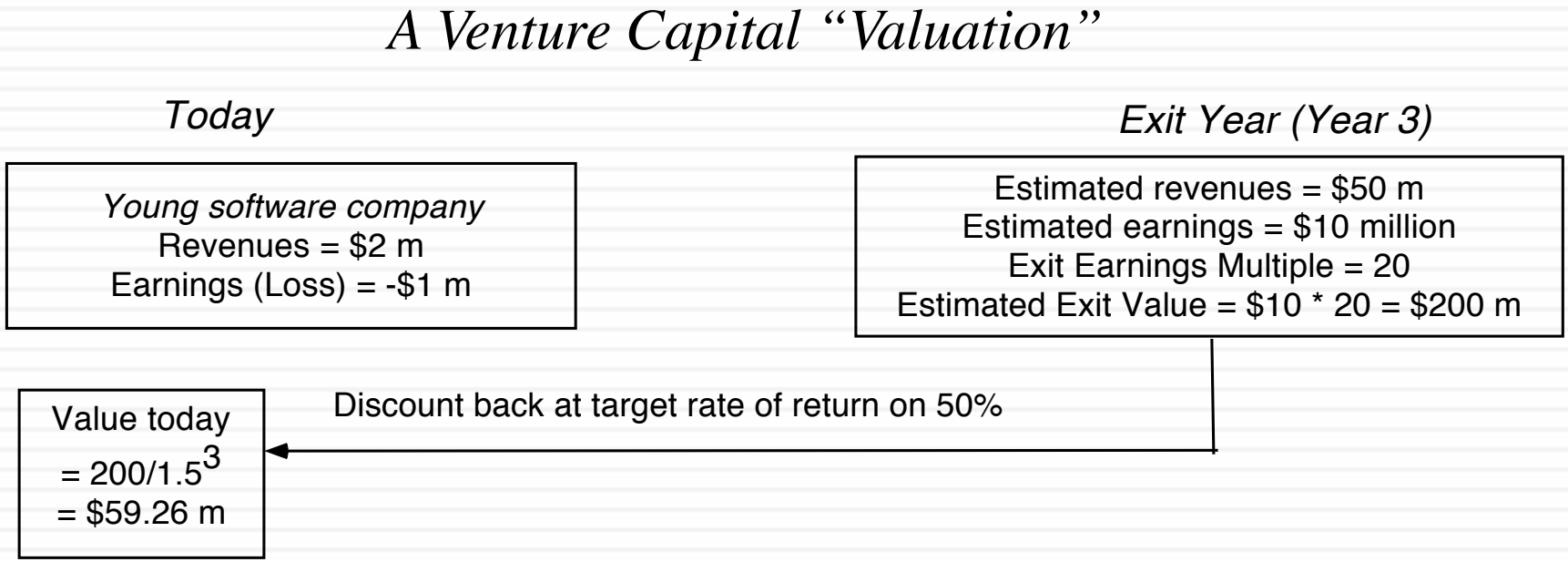
Source: Deutsche Bank

Price/price relative



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

Test 4: Are you pricing or valuing?



Test 5: 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**				

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

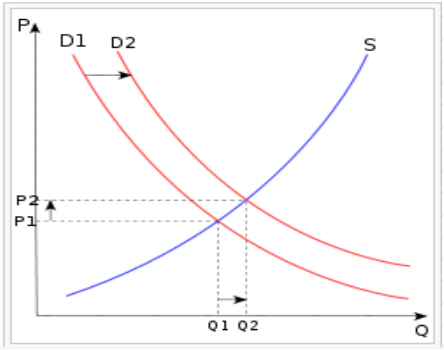
INTRINSIC VALUE

Value

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

Price

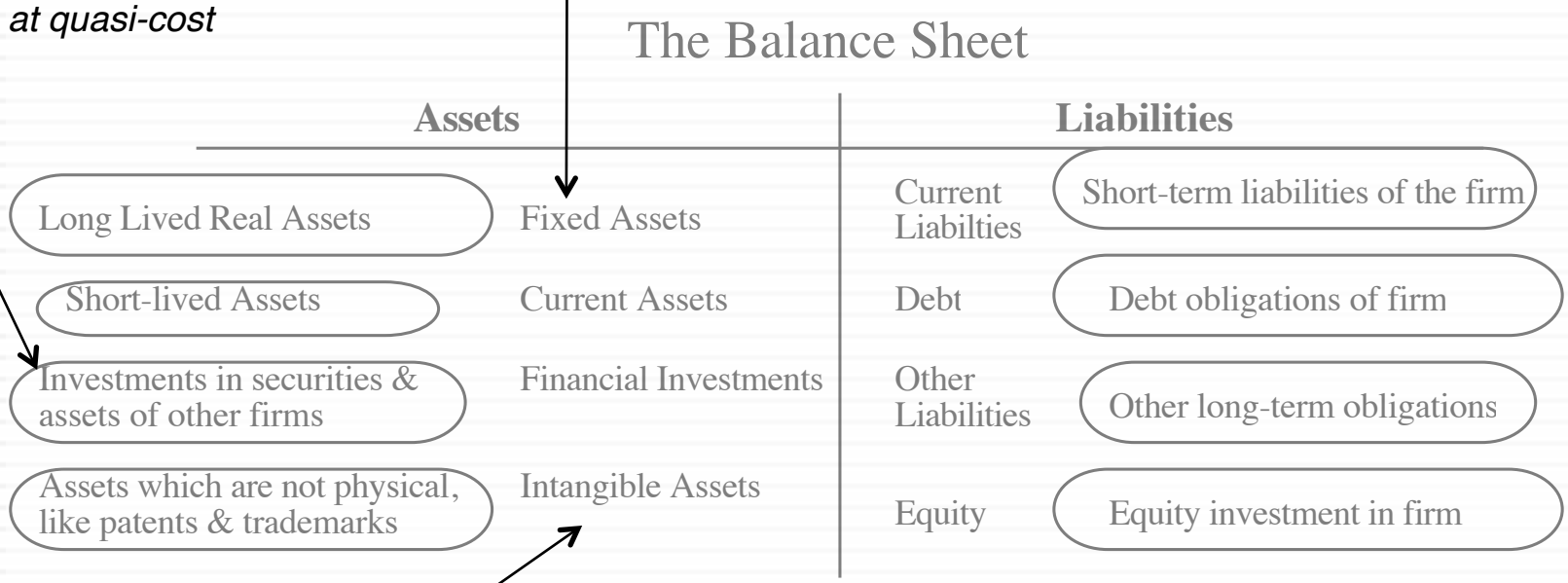
PRICE



The traditional accounting balance sheet…

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 intrinsic value balance sheet

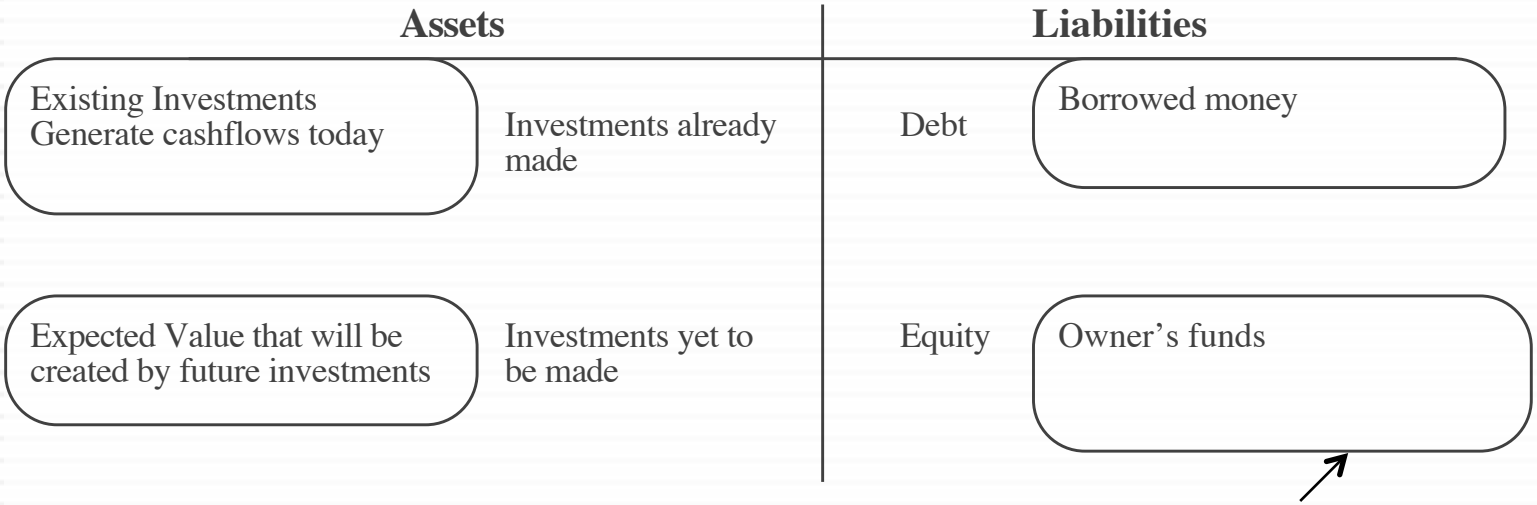
Recorded at intrinsic value (based upon cash flows and risk), not at original cost

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.

The "Market Price" balance sheet

A Market Value Balance Sheet



Should equate to market value of equity, if publicly traded.

Assets recorded at market value, i.e, what investors will be willing to pay for the assets today (rather than original cost or intrinsic value)

Twitter: The Contrast in November 2013

Accounting Balance Sheet

Cash	$550	Debt (leases)	$21
PP&E	$ 62	Preferred stock	$835
Intangible assets	$6	Equity	$202
Goodwill	$ 47		

Intrinsic Value Balance Sheet (post-IPO)

Cash	$ 1,616	Debt	$ 214
Assets in place	$ 73	Equity	$11,106
Growth assets	$ 9,631		

Market Price Balance Sheet (post-IPO)

Cash	$ 1,816	Debt	$ 214
Assets in place	$ 73	Equity	$28,119
Growth assets	$ 26,444		

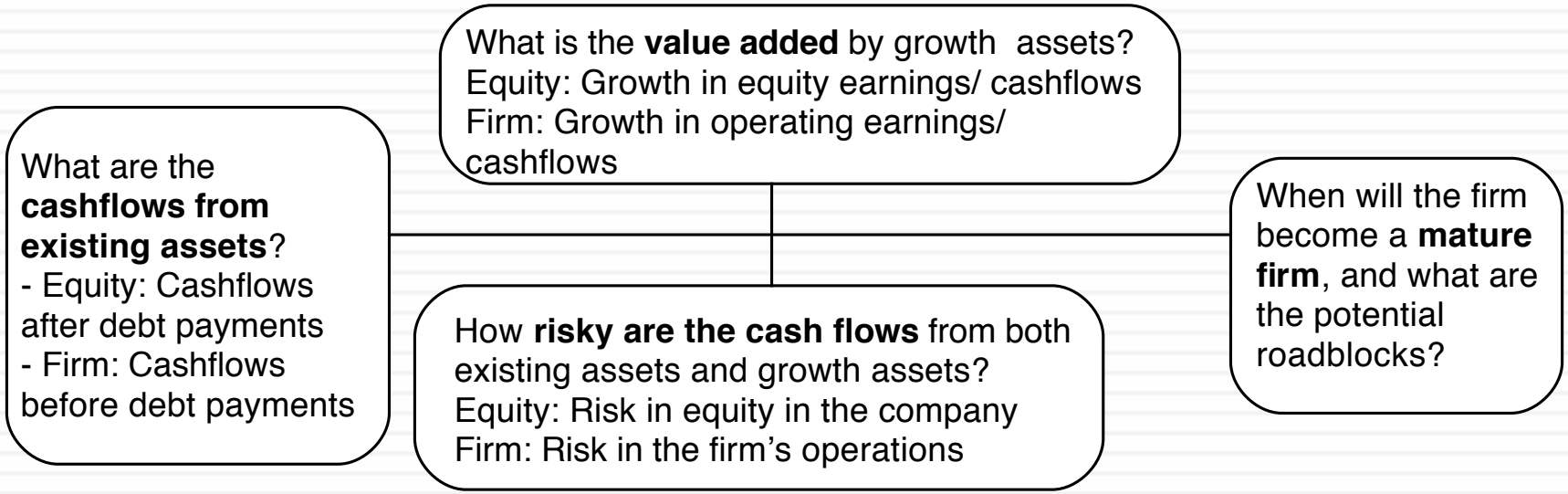
INTRINSIC VALUATION
CASH FLOWS, GROWTH & RISK

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



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.

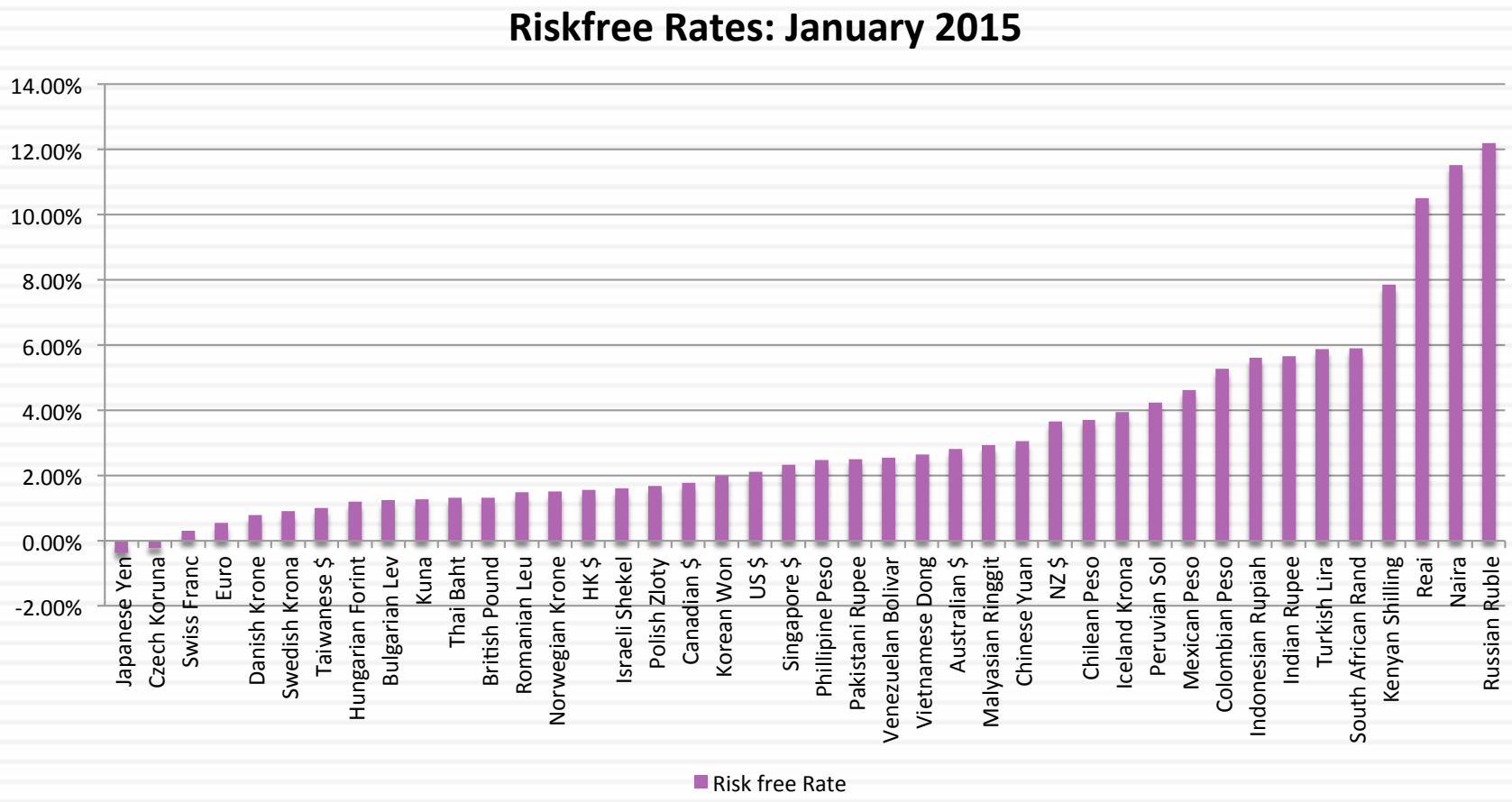
Determined by the business or businesses that you operate in, with more exposure to macro economic risk translating into a higher beta.

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.

Risk free Rates in different currencies



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%**

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%**

Albania	12.50%	6.75%	Montenegro	11.15%	5.40%
Armenia	10.25%	4.50%	Poland	7.03%	1.28%
Azerbaijan	9.05%	3.30%	Romania	9.05%	3.30%
Belarus	15.50%	9.75%	Russia	8.60%	2.85%
Bosnia	15.50%	.75%	Serbia	12.50%	6.75%
Bulgaria	8.60%	2.85%	Slovakia	7.03%	1.28%
Croatia	9.50%	3.75%	Slovenia	9.50%	3.75%
Czech Repub	6.80%	1.05%	Ukraine	20.75%	15.00%
Estonia	6.80%	1.05%	**E. Europe**	**9.08%**	**3.33%**
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%			

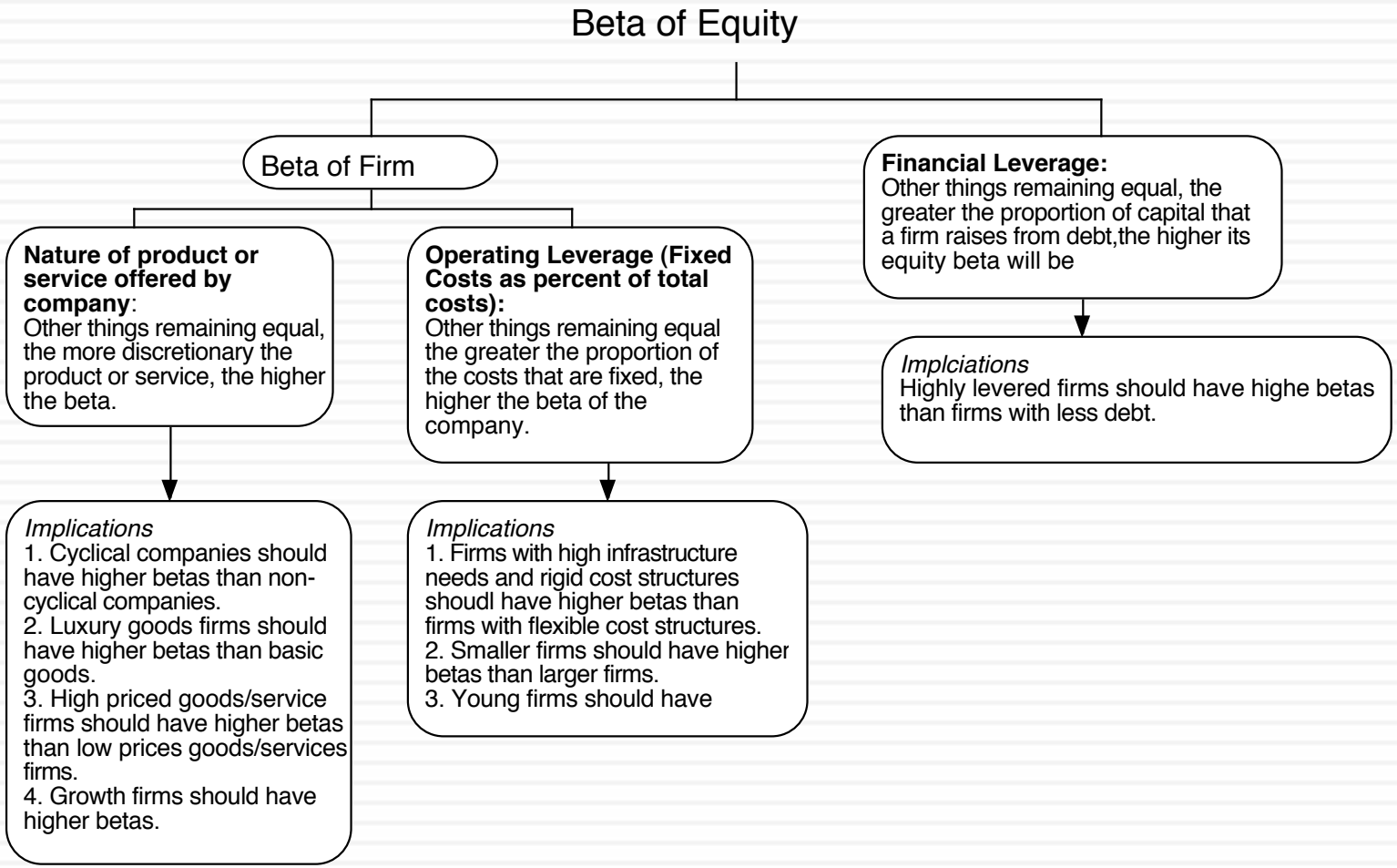
Abu Dhabi	6.50%	0.75%
Bahrain	8.60%	2.85%
Israel	6.80%	1.05%
Jordan	12.50%	6.75%
Kuwait	6.50%	0.75%
Lebanon	14.00%	8.25%
Oman	6.80%	1.05%
Qatar	6.50%	0.75%
Ras Al Khaimah	7.03%	1.28%
Saudi Arabia	6.65%	0.90%
Sharjah	7.55%	1.80%
UAE	6.50%	0.75%
Middle East	**6.85%**	**1.10%**

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%**

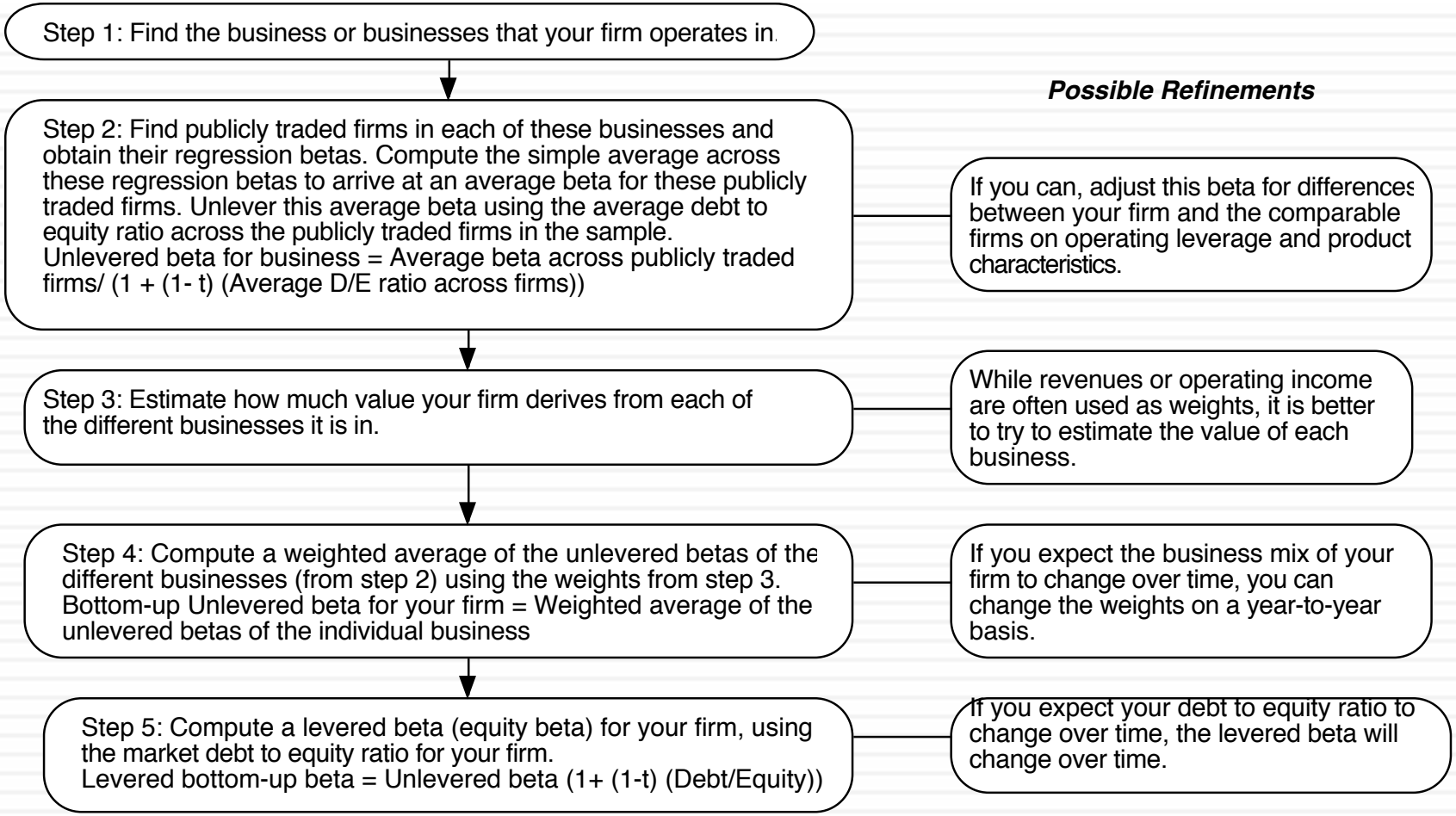
Black #: Total ERP
Red #: Country risk premium
AVG: GDP weighted average

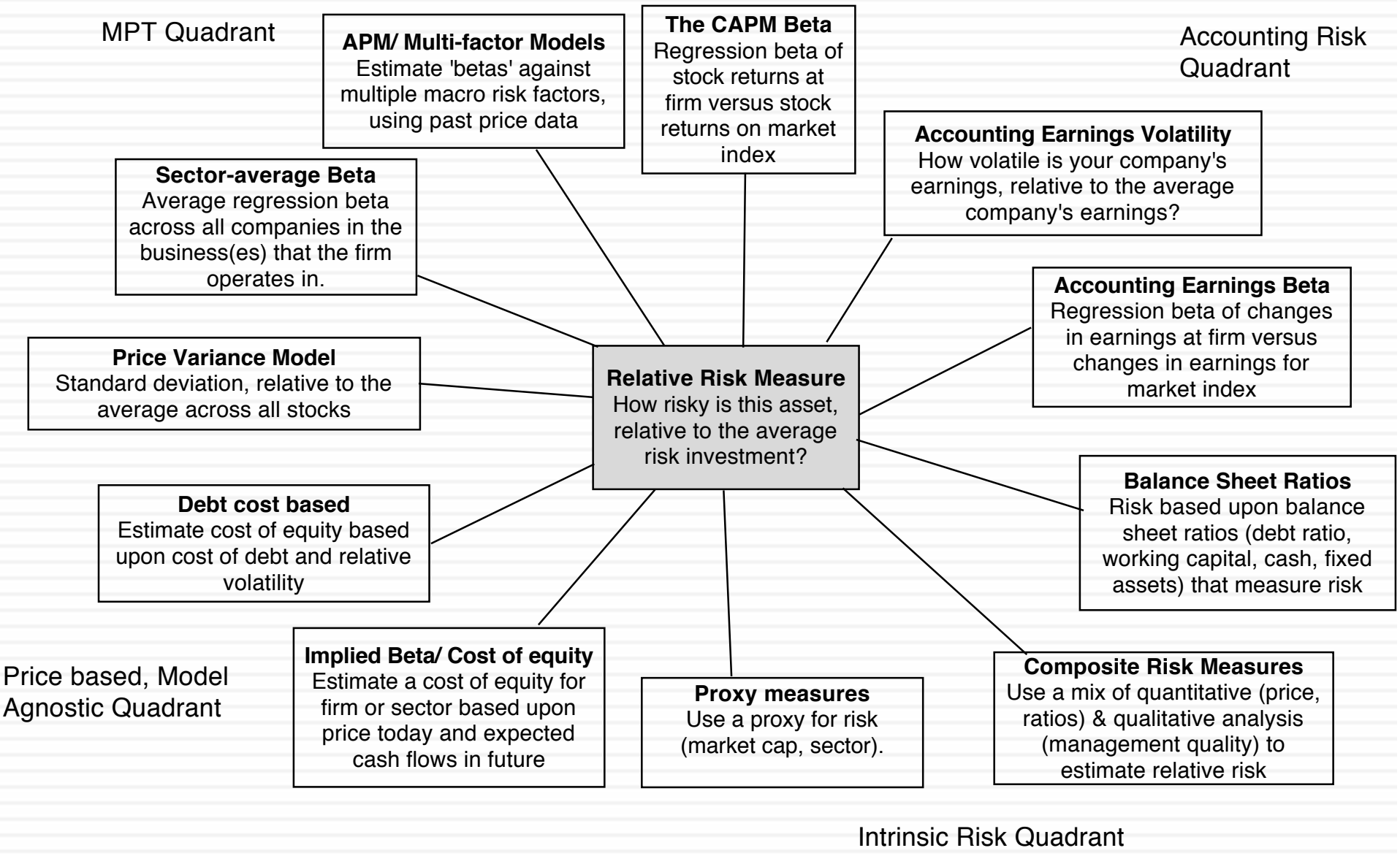
Australia	5.75%	0.00%
Cook Islands	12.50%	6.75%
New Zealand	5.75%	0.00%
Australia & NZ	**5.75%**	**0.00%**

Determinants of Betas

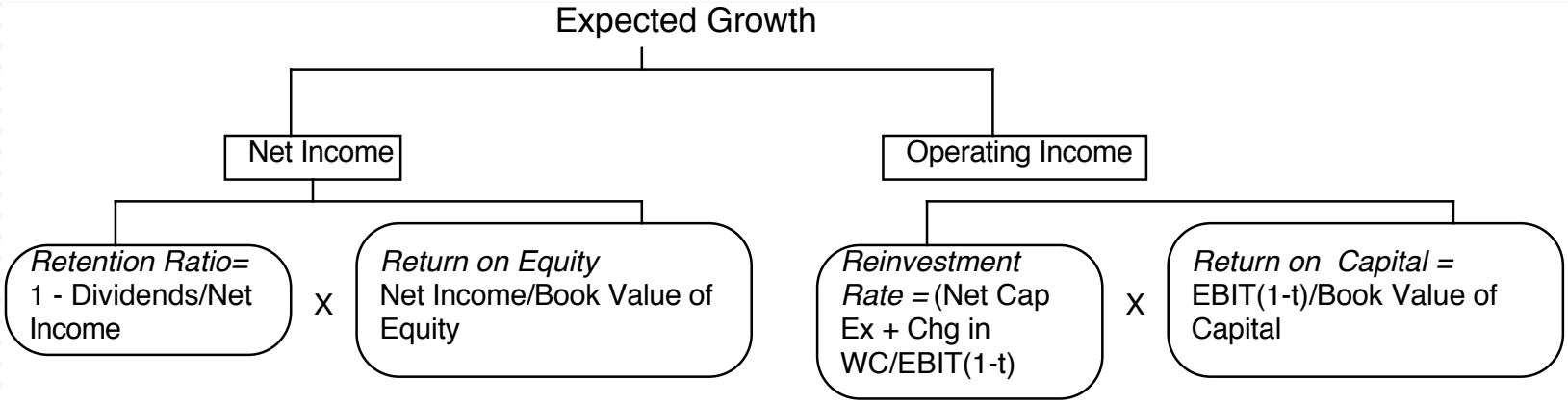


Bottom-up Betas




MPT Quadrant
APM/ Multi-factor Models
Estimate 'betas' against multiple macro risk factors, using past price data
The CAPM Beta
Regression beta of stock returns at firm versus stock returns on market index
Accounting Risk Quadrant
Accounting Earnings Volatility
How volatile is your company's earnings, relative to the average company's earnings?
Sector-average Beta
Average regression beta across all companies in the business(es) that the firm operates in.
Accounting Earnings Beta
Regression beta of changes in earnings at firm versus changes in earnings for market index
Price Variance Model
Standard deviation, relative to the average across all stocks
Relative Risk Measure
How risky is this asset, relative to the average risk investment?
Balance Sheet Ratios
Risk based upon balance sheet ratios (debt ratio, working capital, cash, fixed assets) that measure risk
Debt cost based
Estimate cost of equity based upon cost of debt and relative volatility
Price based, Model Agnostic Quadrant
Implied Beta/ Cost of equity
Estimate a cost of equity for firm or sector based upon price today and expected cash flows in future
Proxy measures
Use a proxy for risk (market cap, sector).
Composite Risk Measures
Use a mix of quantitative (price, ratios) & qualitative analysis (management quality) to estimate relative risk
Intrinsic Risk Quadrant

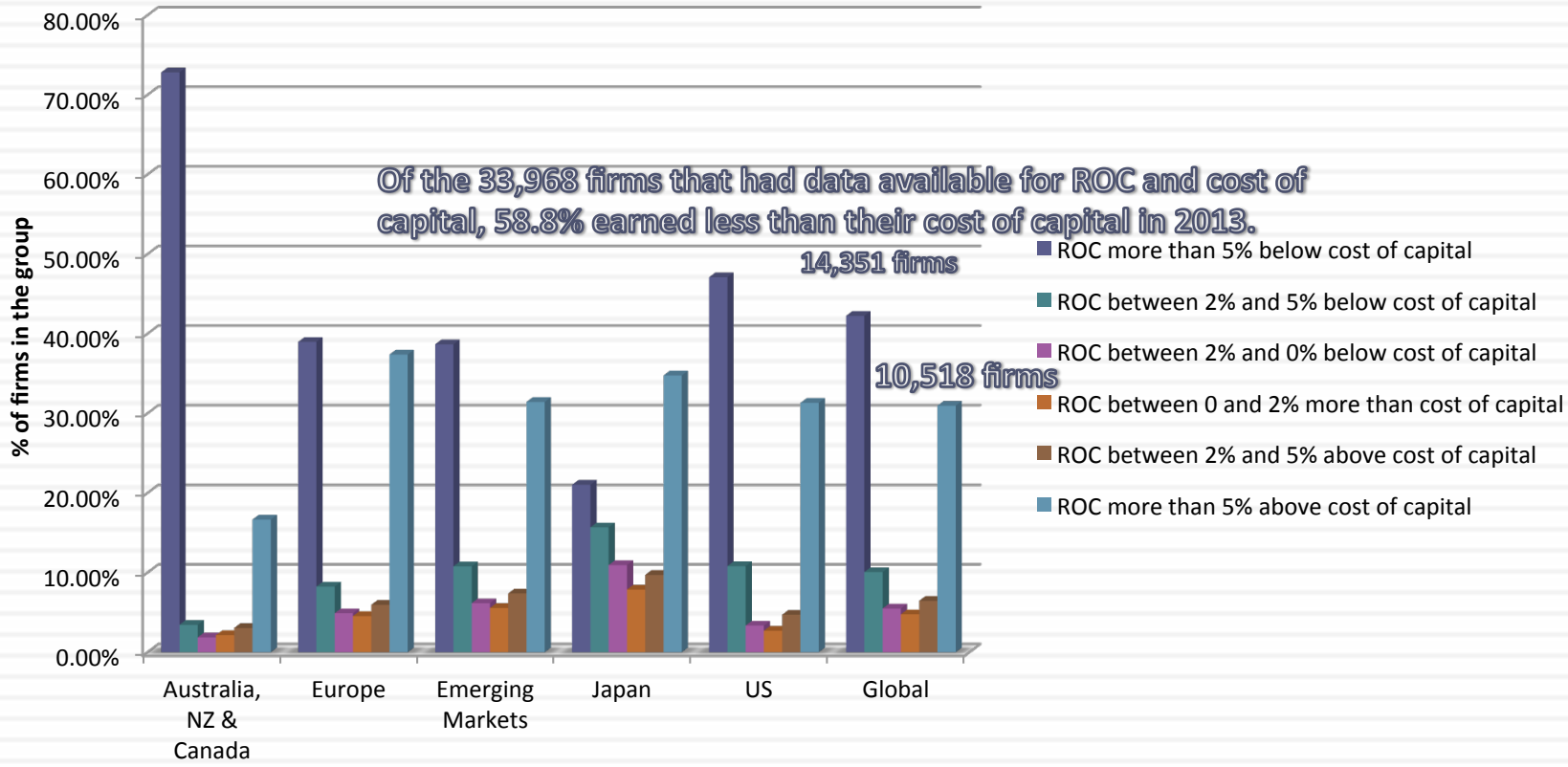
3. Expected Growth



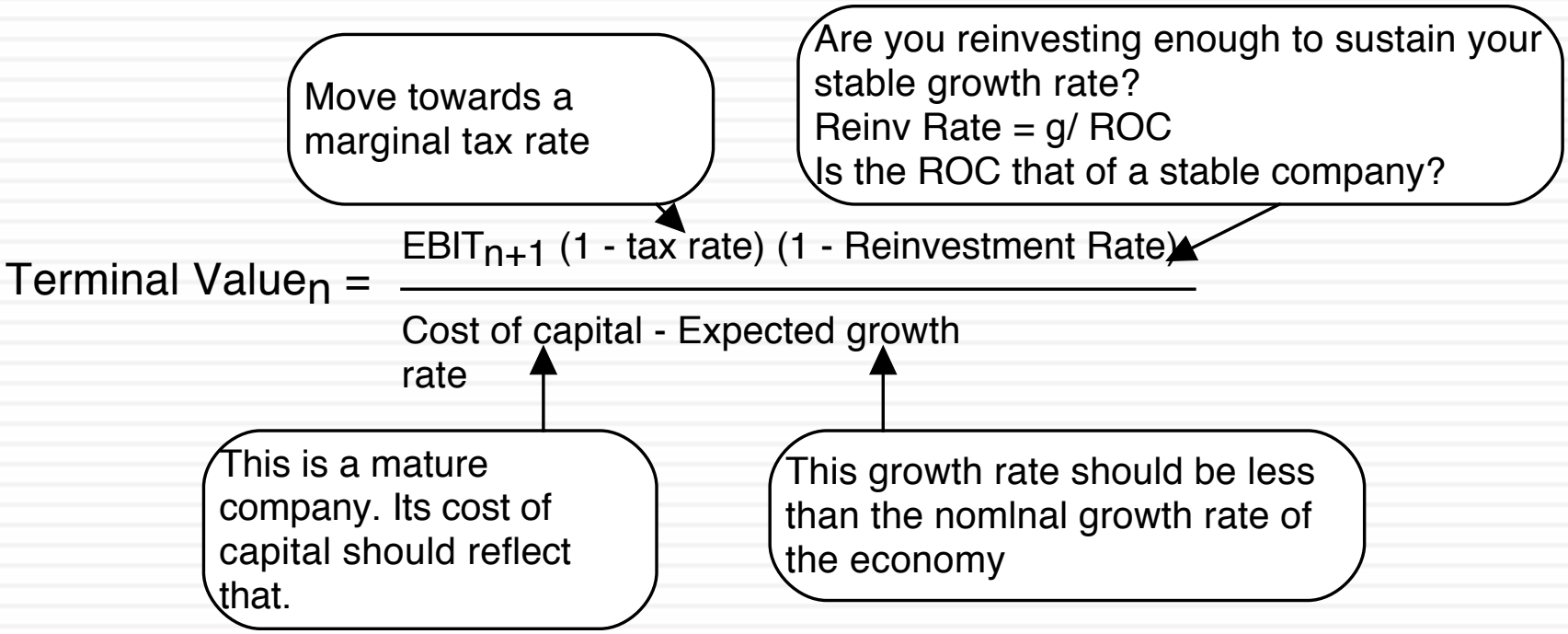
- Quality growth is rare and requires that a firm be able to reinvest a lot and reinvest well (earnings more than your cost of capital) at the same time.
- The larger you get, the more difficult it becomes to maintain quality growth.
- You can grow while destroying value at the same time.

And its value…

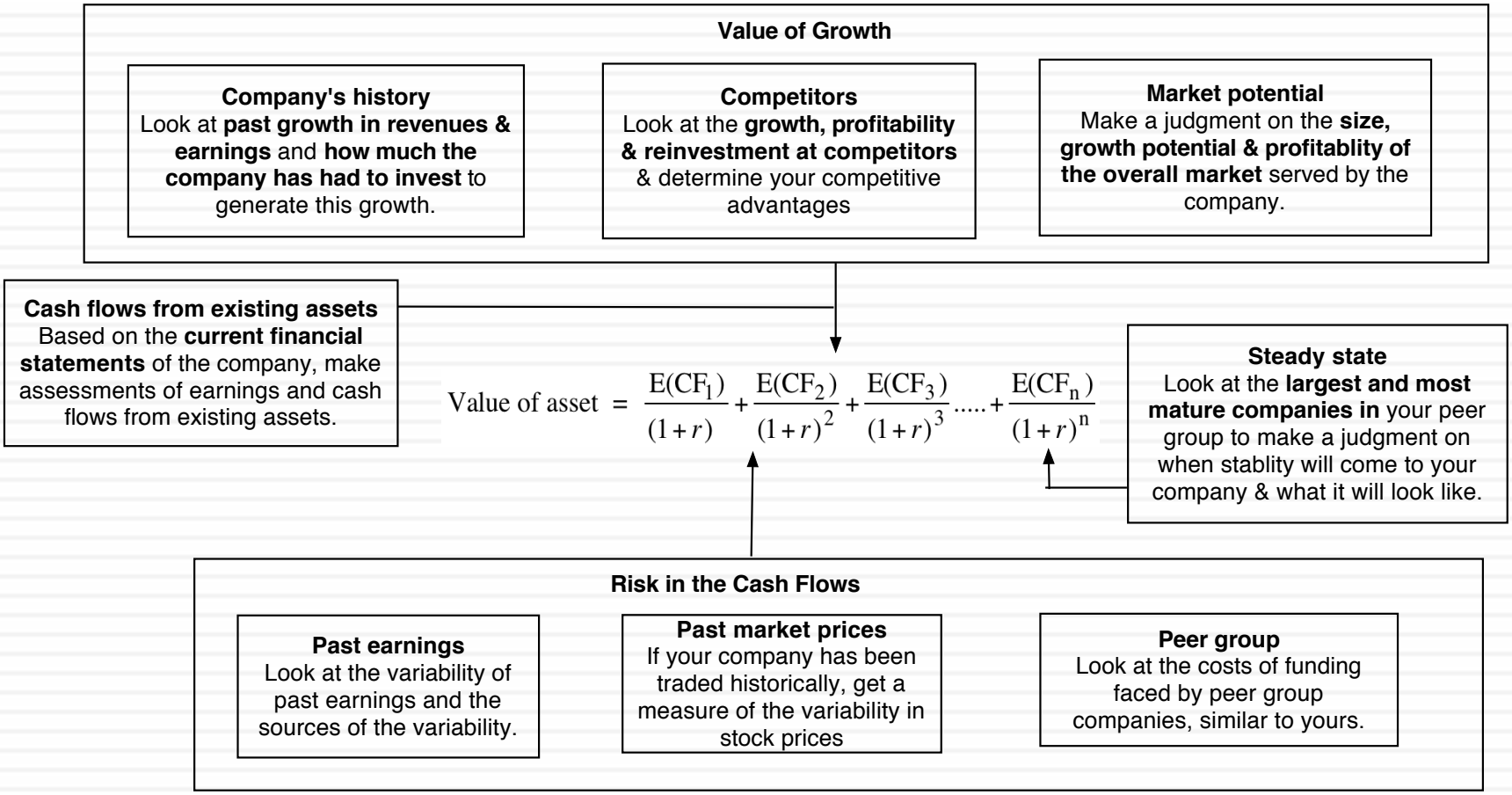
ROIC versus Cost of Capital: A Global Assessment for 2013



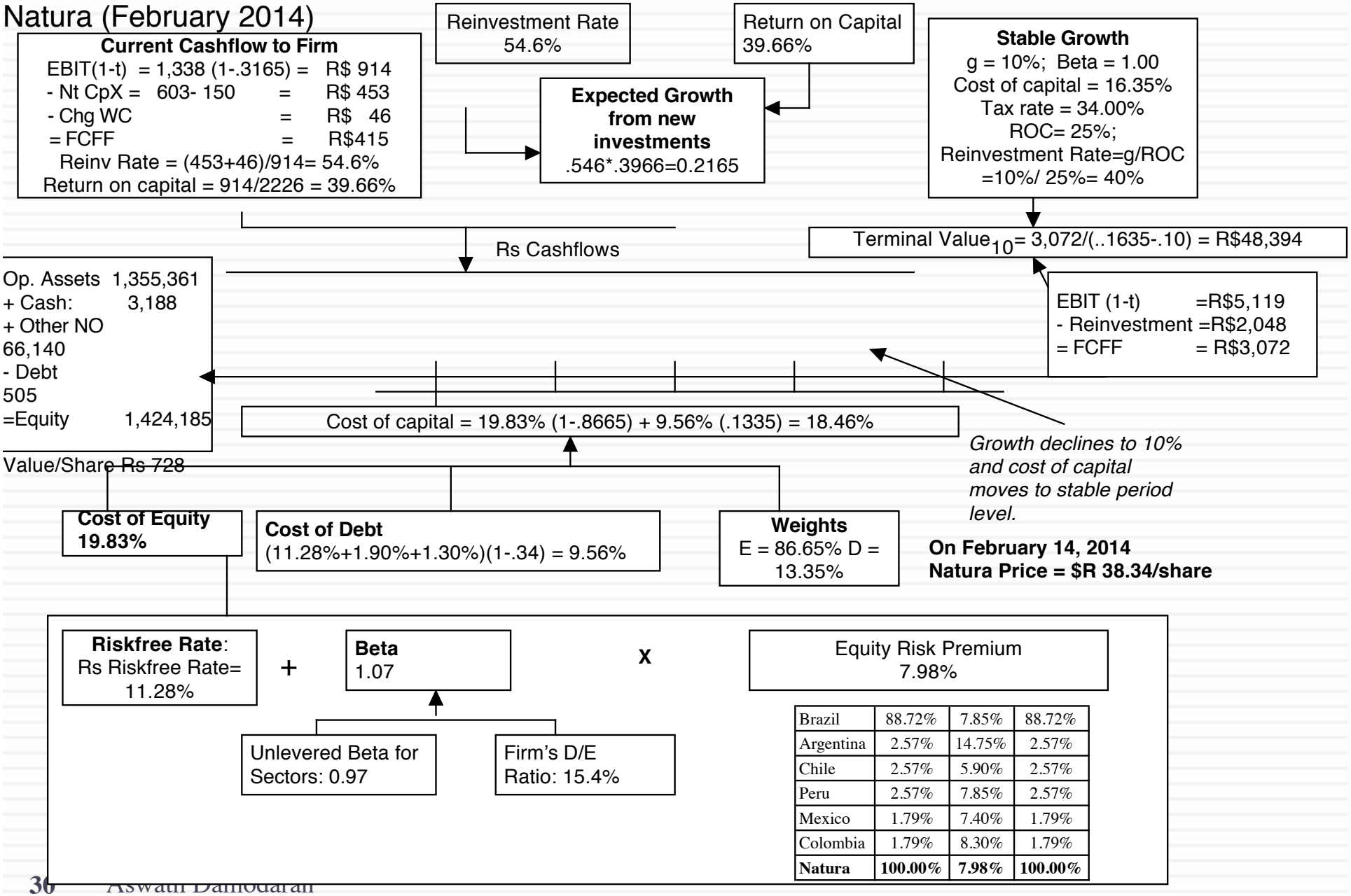
4. The Terminal Value



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



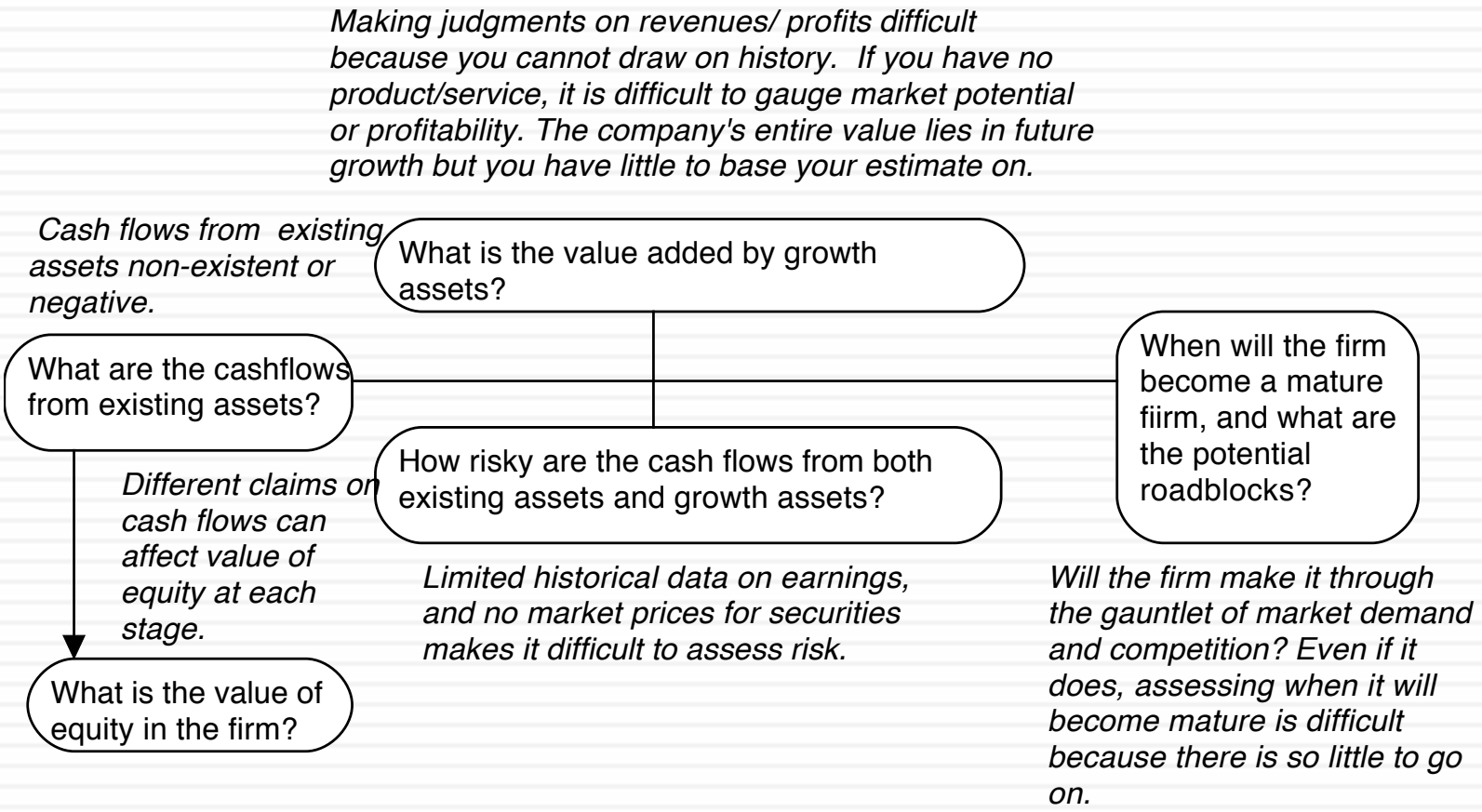
Natura (February 2014)



Brazil	88.72%	7.85%	88.72%
Argentina	2.57%	14.75%	2.57%
Chile	2.57%	5.90%	2.57%
Peru	2.57%	7.85%	2.57%
Mexico	1.79%	7.40%	1.79%
Colombia	1.79%	8.30%	1.79%
Natura	**100.00%**	**7.98%**	**100.00%**

So, how about a young start-up company?

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



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

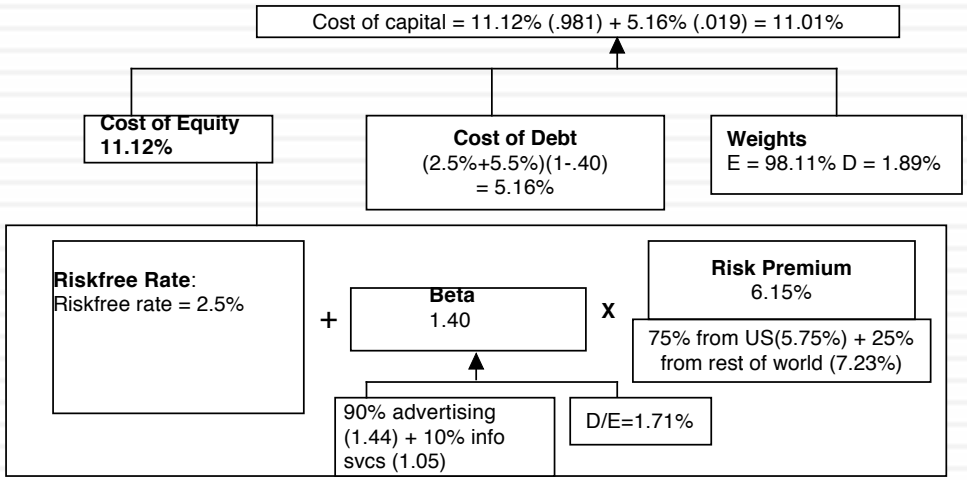
	Sales/ Invested Capital
Twitter (2013)	1.10
Advertising Companies	1.40
Social Media Companies	1.05

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

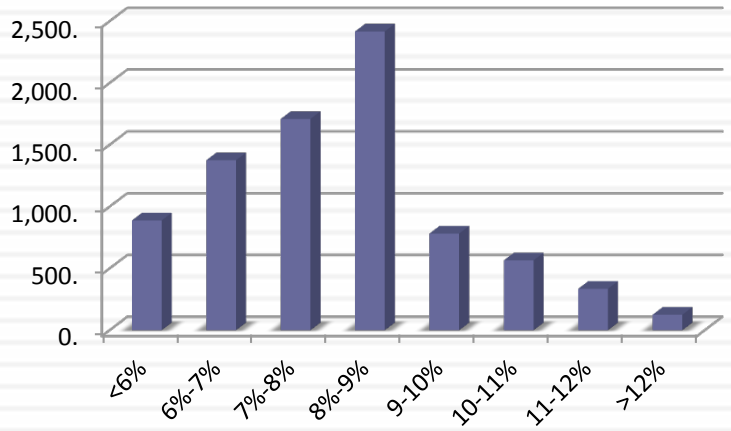
Sweating the small stuff: Risk and Required Return

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

x

Risk Premium
6.15%

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

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

D/E=1.71%

Starting numbers

Twitter Valuation after first earnings report: February 8, 2014

	2013	2012
Revenues	$664.9	$316.9
Operating Income	-$635.8	-$77.1
Adjusted Operating Income	-$147.0	-$7.7
Invested Capital	$1,816.0	
Adjusted Operating Margin	-$0.2	
Sales/Invested Capital	$0.8	

Revenue growth of 50% a year for 5 years, tapering down to 2.75% 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 = 2.75%;
Cost of capital = 8%
ROC= **12**%;
Reinvestment Rate=2.75%/12% =22.92%

Terminal Value$_{10}$= 1666/(.08-.025) = $31,741

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Revenues	$ 997	$1,496	$2,244	$3,366	$ 5,049	$7,096	$9,303	$11,318	$12,698	$13,048
Operating Income	$(174)	$ (190)	$ (179)	$ (110)	$ 73	$ 437	$1,011	$ 1,763	$ 2,576	$ 3,262
Operating Income after-tax	$(174)	$ (190)	$ (179)	$ (110)	$ 73	$ 437	$1,011	$ 1,234	$ 1,690	$ 2,104
Reinvestment	$ 222	$ 332	$ 499	$ 748	$ 1,122	$1,365	$1,471	$ 1,343	$ 921	$ 233
FCFF	$(395)	$ (522)	$ (678)	$ (858)	$(1,049)	$ (928)	$ (460)	$ (109)	$ 770	$ 1,871

Terminal year (11)

EBIT (1-t)	$ 2,162
- Reinvestment	$ 495
FCFF	$ 1,666

Operating assets	$11,767
+ Cash	2,234
- Debt	397
Value of equity	13,604
- Options	2,183
Value in stock	11,421
/ # of shares	582.46
Value/share	$**19.61**

Cost of capital = 8.72% (.987) + 3.87% (.013) = 8.66%

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

Cost of Equity
8.72%

Cost of Debt
(2.5%+3.5%)(1-.355)
= 3.87%

Weights
E = 98.7% D = 1.3%

Riskfree Rate:
Riskfree rate = 2.75%

+

Beta
1.12

x

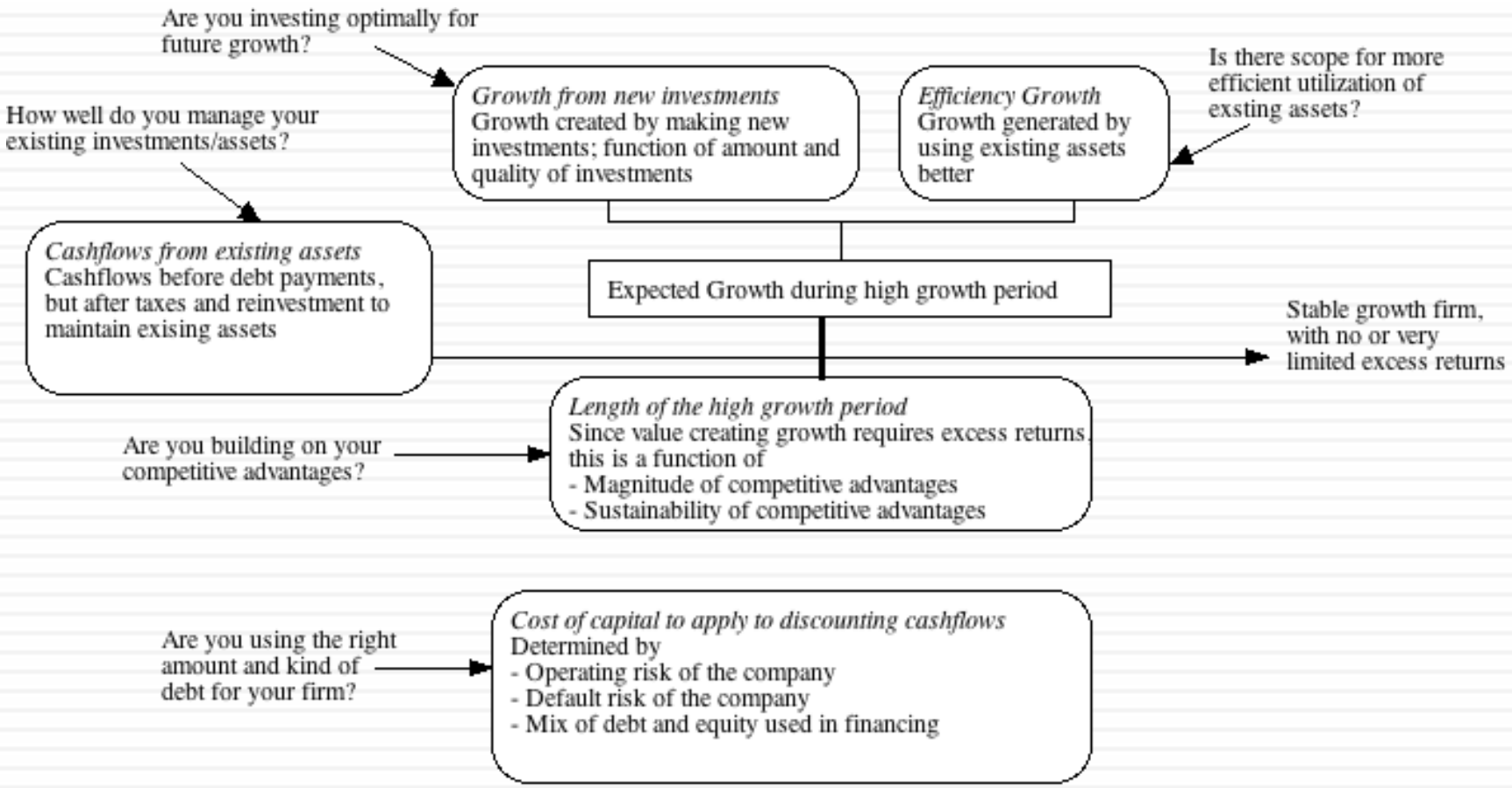
Risk Premium
5.35%

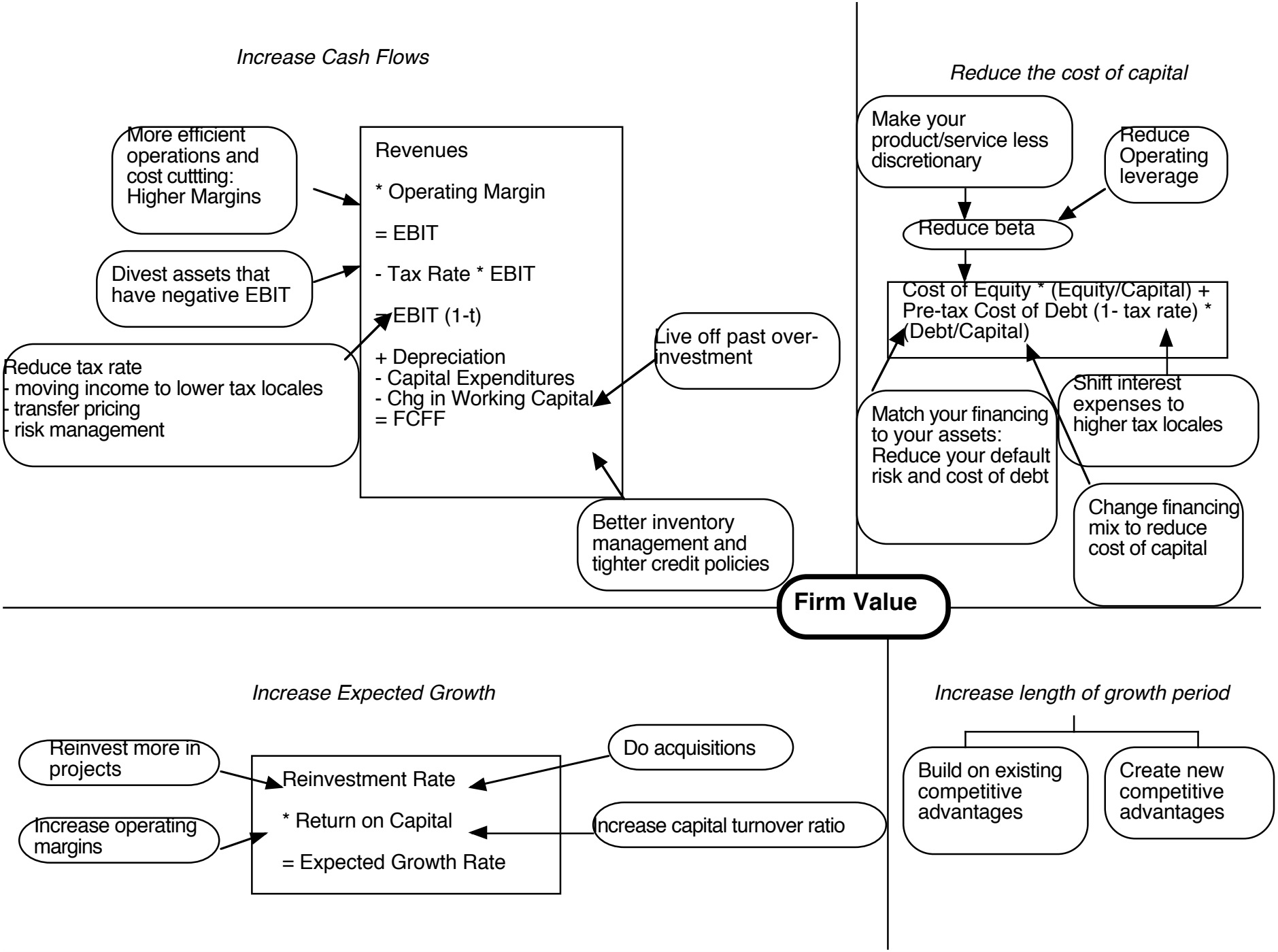
75% from US(5.00%) + 25% from rest of world (6.93%)

92% advertising (1.13) + 8% info svcs (1.02)

D/E=1.29%

If your job is enhancing value, it's got to come from changing the fundamentals




Increase Cash Flows
More efficient operations and cost cuttting: Higher Margins
Divest assets that have negative EBIT
Reduce tax rate
- moving income to lower tax locales
- transfer pricing
- risk management
Revenues
* Operating Margin
= EBIT
- Tax Rate * EBIT
= EBIT (1-t)
+ Depreciation
- Capital Expenditures
- Chg in Working Capital
= FCFF
Live off past over-investment
Better inventory management and tighter credit policies
Reduce the cost of capital
Make your product/service less discretionary
Reduce Operating leverage
Reduce beta
Cost of Equity * (Equity/Capital) + Pre-tax Cost of Debt (1- tax rate) * (Debt/Capital)
Match your financing to your assets: Reduce your default risk and cost of debt
Shift interest expenses to higher tax locales
Change financing mix to reduce cost of capital
Firm Value
Increase Expected Growth
Reinvest more in projects
Increase operating margins
Reinvestment Rate
* Return on Capital
= Expected Growth Rate
Do acquisitions
Increase capital turnover ratio
Increase length of growth period
Build on existing competitive advantages
Create new competitive advantages

And intrinsic value can change a lot, especially for young companies & in market crisis

Company-specific	1. Company: The most obvious source of information is the company itself, with earnings reports being the most frequently used vehicle for delivery of that information. 2. Outsiders: Some company-specific information is unearthed by investors and analysts in the course of doing research on the company, without accessing either company insiders or proprietary corporate data.
Sector-wide	1. Other companies in the sector: Earnings and investment announcements by other companies in the sector can be used to reassess investor expectations of market potential and profitability. 2. Sector research: There are sector experts and consultants whose job it is to collect information about the overall sector and analyze it, with the intent of assessing sector trends and prospects.
Macro economic	1. Government: The biggest source of macroeconomic data (interest rates, inflation, economic growth) is the government through its many institutions. 2. Private entities: There are private entities that also generate macroeconomic data that markets react to. In the US, for instance ADP (a publicly traded company) produces a monthly national employment report and the Conference Board reports a composite index of leading economic indicators.

Valuing Vale in November 2013 (in US dollars)

Let's start with some history & estimate what a normalized year will look like

Year	Operating Income ($)	Effective tax rate	BV of Debt	BV of Equity	Cash	Invested capital	Return on capital
2009	$6,057	27.79%	$18,168	$42,556	$12,639	$48,085	9.10%
2010	$23,033	18.67%	$23,613	$59,766	$11,040	$72,339	25.90%
2011	$30,206	18.54%	$27,668	$70,076	$9,913	$87,831	28.01%
2012	$13,346	18.96%	$23,116	$78,721	$3,538	$98,299	11.00%
2013 (TTM)	$15,487	20.65%	$30,196	$75,974	$5,818	$100,352	12.25%
Normalized	**$17,626**	**20.92%**					**17.25%**

Estimate the costs of equity & capital for Vale

Business	*Sample size*	*Unlevered beta of business*	*Revenues*	*Peer Group EV/Sales*	*Value of Business*	*Proportion of Vale*
Metals & Mi	48	0.86	$9,013	1.97	$17,739	16.65%
Iron Ore	78	0.83	$32,717	2.48	$81,188	76.20%
Fertilizers	693	0.99	$3,777	1.52	$5,741	5.39%
Logistics	223	0.75	$1,644	1.14	$1,874	1.76%
Vale Operations		*0.8440*	*$47,151*		*$106,543*	*100.00%*

Market D/E = 54.99%
Marginal tax rate = 34.00% (Brazil)
Levered Beta = 0.844 (1+(1-.34)(.5499)) = 1.15
Cost of equity = 2.75% + 1.15 (7.38%) = 10.87%

	% of revenues	ERP
US & Canada	4.90%	5.50%
Brazil	16.90%	8.50%
Rest of Latin America	1.70%	10.09%
China	37.00%	6.94%
Japan	10.30%	6.70%
Rest of Asia	8.50%	8.61%
Europe	17.20%	6.72%
Rest of World	3.50%	10.06%
Vale ERP	**100.00%**	**7.38%**

Vale's rating: A-
Default spread based on rating = 1.30%
Cost of debt (pre-tax) = 2.75% + 1.30% = 4.05%

Cost of capital = 11.23% (.6452) + 4.05% (1-.34) (.3548) = 8.20%

Assume that the company is in stable growth, growing 2% a year in perpetuity

$$Reinvestment\ Rate = \frac{g}{ROC} = \frac{2\%}{17.25\%} = 11.59\%$$

$$Value\ of\ Operating\ Assets = \frac{17{,}626\ (1-.2092)(1-\ .1159)}{(.082-.02)} = \$202{,}832$$

Value of operating assets	= $202,832
+ Cash & Marketable Securities	= $ 7,133
- Debt	= $ 42,879
Value of equity	= $167,086
Value per share	=$ 32.44
Stock price (11/2013)	= $ 13.57

Valuing Vale in April 2015 (in US dollars)

Let's start with some history & estimate what a normalized year will look like

Earning Surprise
Vale's last quarter earnings report came in well below expectations.

Year	Operating Income ($)	Effective tax rate	BV of Debt	BV of Equity	Cash	Invested capital	ROIC
2010	$23,033	18.67%	$23,613	$59,766	$11,040	$72,339	25.90%
2011	$30,206	18.54%	$27,668	$70,076	$9,913	$87,831	28.01%
2012	$13,434	18.96%	$23,116	$78,721	$3,538	$98,299	11.08%
2013	$17,596	15.00%	$30,196	$75,974	$5,818	$100,352	14.90%
2014	$8,497	20.00%	$29,198	$64,393	$5,277	$88,314	7.70%
Average	**$18,553**	**18.23%**					**17.52%**

Petrobrased?
Vale could become the government's new focus, now that Petrobras is beyond repair.

Estimate the costs of equity & capital for Vale

Business	Unlevered beta	Proportion of value	D/E ratio	Levered beta
Metals & Mining	0.86	16.65%	90.63%	1.3744
Iron Ore	0.83	76.20%	90.63%	1.3264
Fertilizers	0.99	5.39%	90.63%	1.5821
Logistics	0.75	1.76%	90.63%	1.1986
Vale Operations	**0.84**	**100%**	**90.63%**	**1.3424**

Region	% of total	ERP
Brazil	68%	8.60%
Rest of the world	32%	7.18%
Vale		8.15%

Riskfree Rate	2.00%
Default Spread for Brazil	3.00%
Default spread for Vale	2.00%
Cost of debt for Vale (pre-tax)	7.00%

Brazil's rating & equity markets have held up, but its reputation and currency have suffered. ERP & Default Spreads (country & Vale) have widened.

Cost of equity = 2.00% + 1.3424 (8.15%) = 12.93%
Cost of capital = 12.93% (.5246) + 7.00% (1-.34) (.4754) = 8.98%

Assume that the company is in stable growth, growing 2% a year in perpetuity, with the last 12 months as the base year for operating income and assuming return on capital = cost of capital in perpetuity.

$$\text{Reinvestment Rate} = \frac{\text{Expected growth rate}}{\text{Return on Capital}} = \frac{2\%}{8.98\%} = 22.27\%$$

$$\text{Value of Operating Assets} = \frac{\$8,497\ (1.02)\ (1-.1823)(1-.2227)}{(.0898-.02)} = \$77,195$$

Value of operating assets	= $ 77,195
+ Cash & Equity in Affliates	= $ 8,121
- Debt & Minority Interests	= $ 30,108
Value of equity	= $ 55,208
Value per share	**=$ 10.71**
Stock price (4/15/15)	= $ 6.19

Three simple suggestions to make you better at estimating intrinsic value!

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).

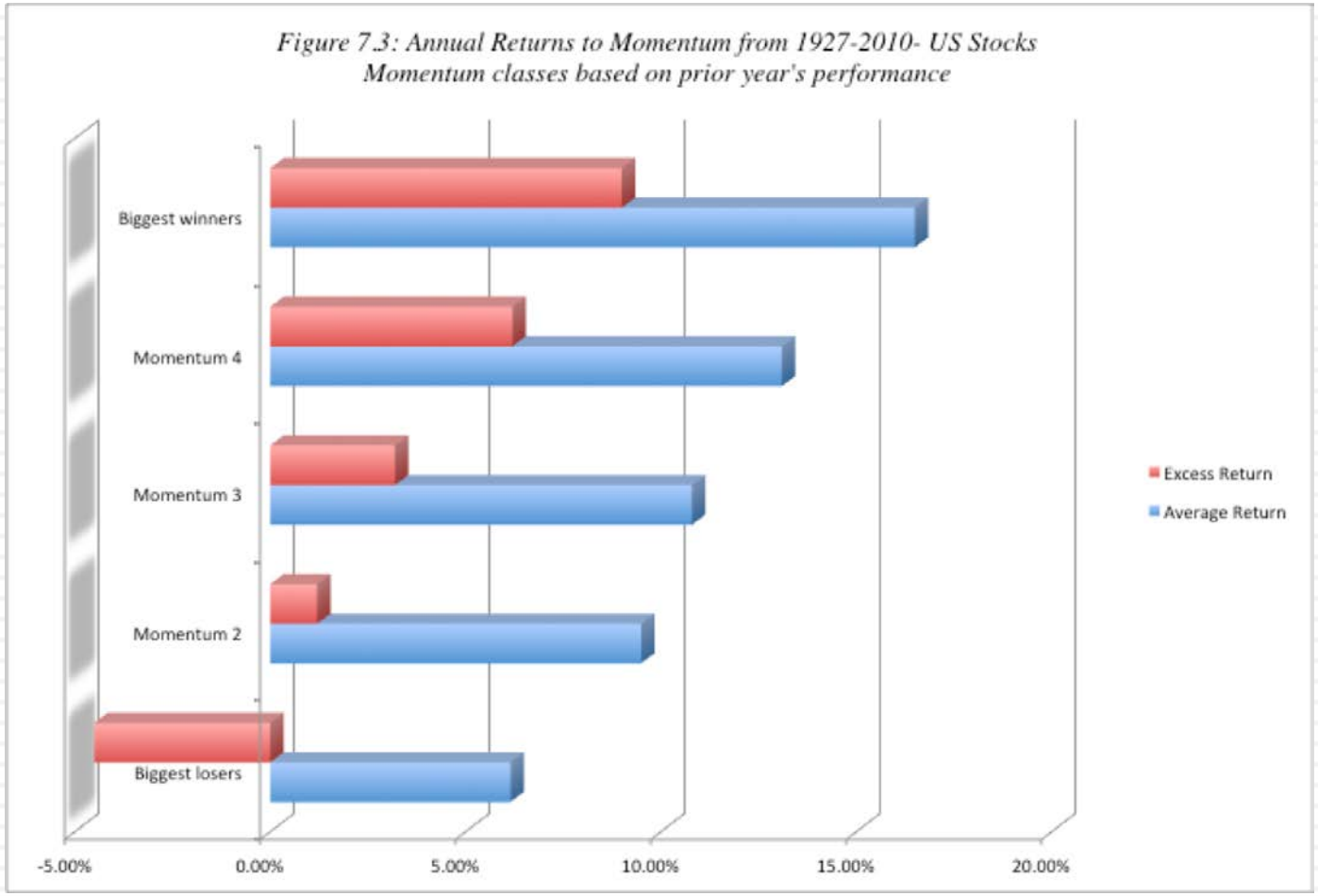
Liquidity & Trading Ease
While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

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

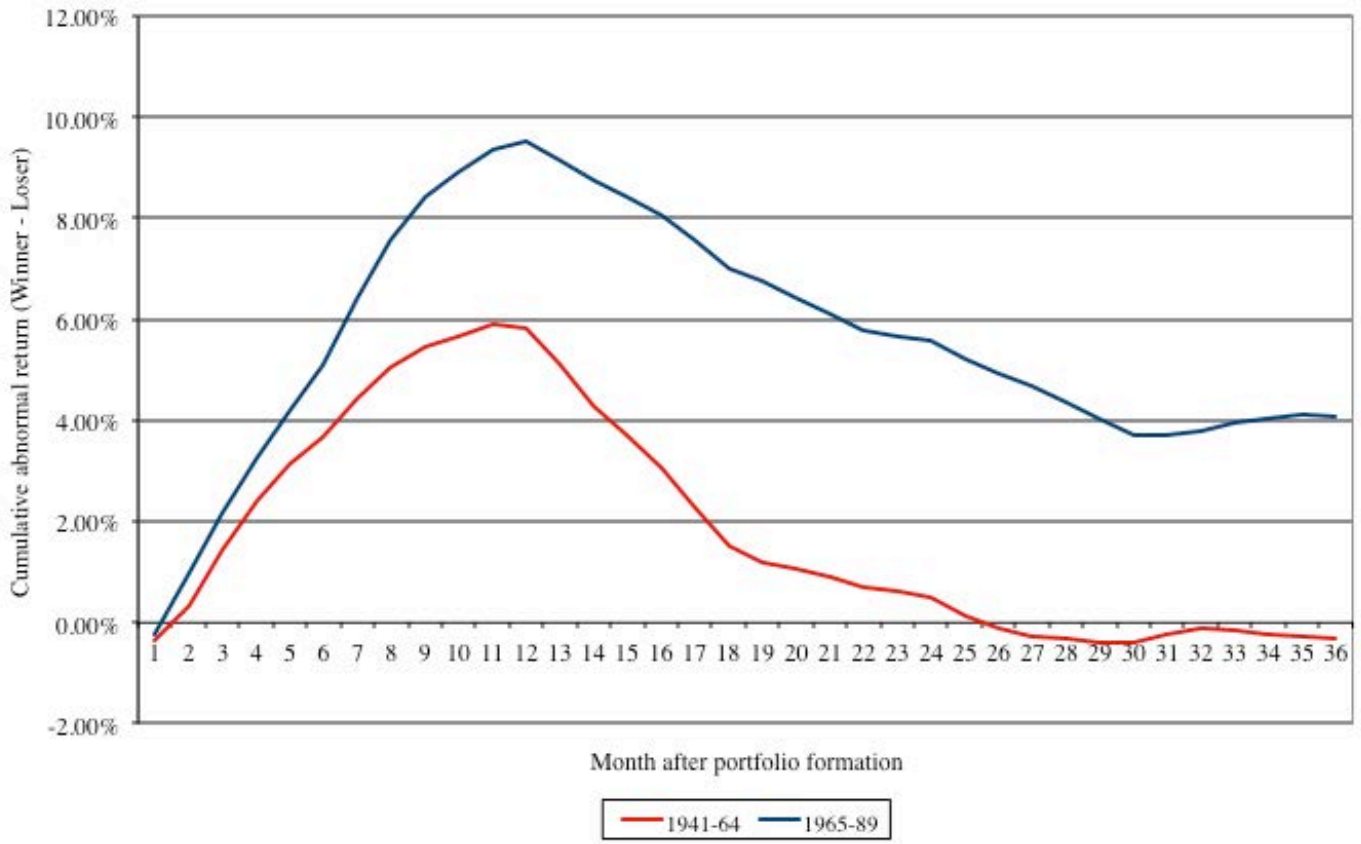
Group Think
To the extent that pricing is about gauging what other investors will do, the price can be determined by the "herd".

1a. The Momentum Game

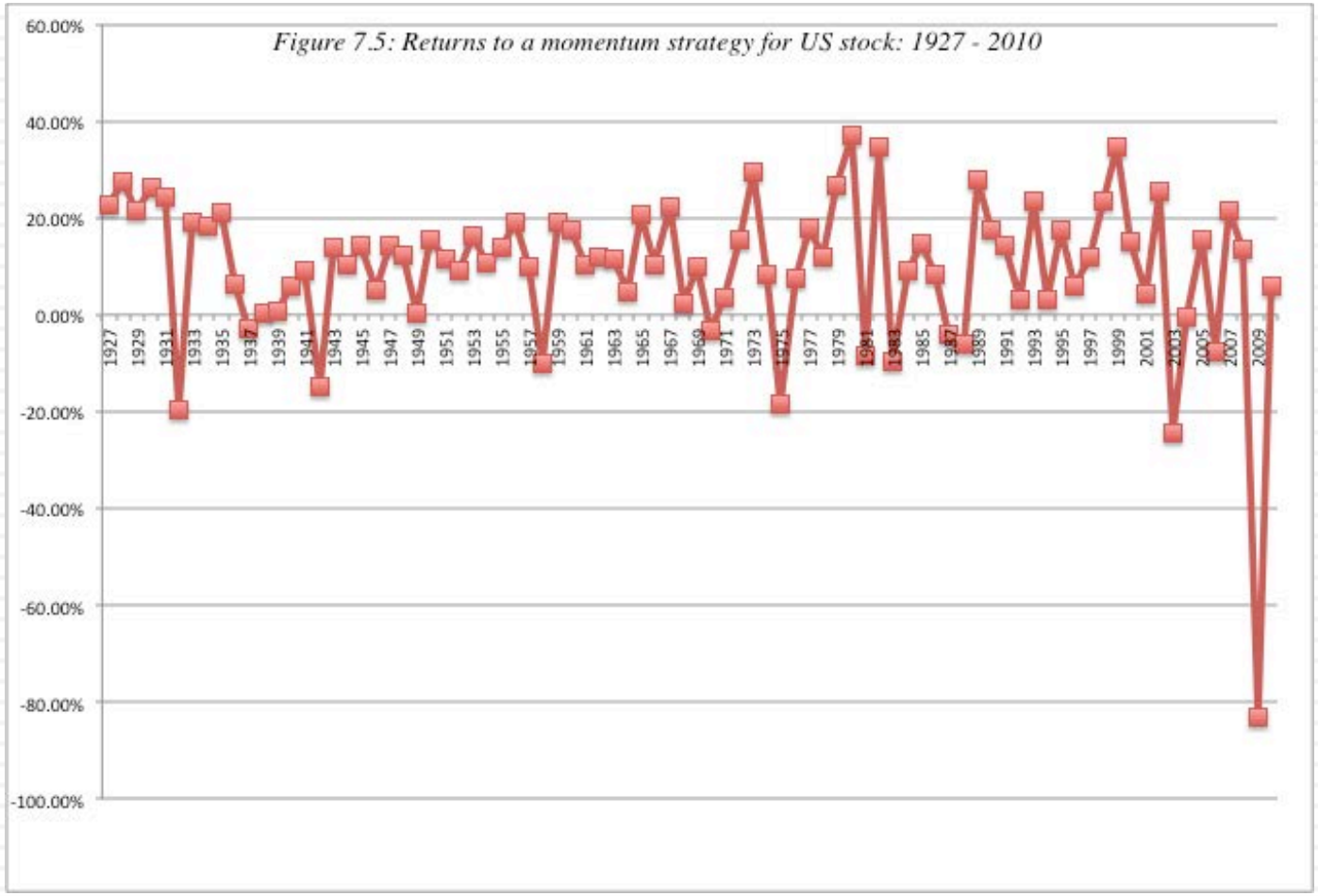


With inflection points

Figure 7: Differential Returns - Winner versus Loser Portfolios



The momentum game works, until it does not…



1b. Mood matters

Used a computer algorithm & 9.7 million tweets to see if you can predict movements in the Dow 30. Find 87% correlation

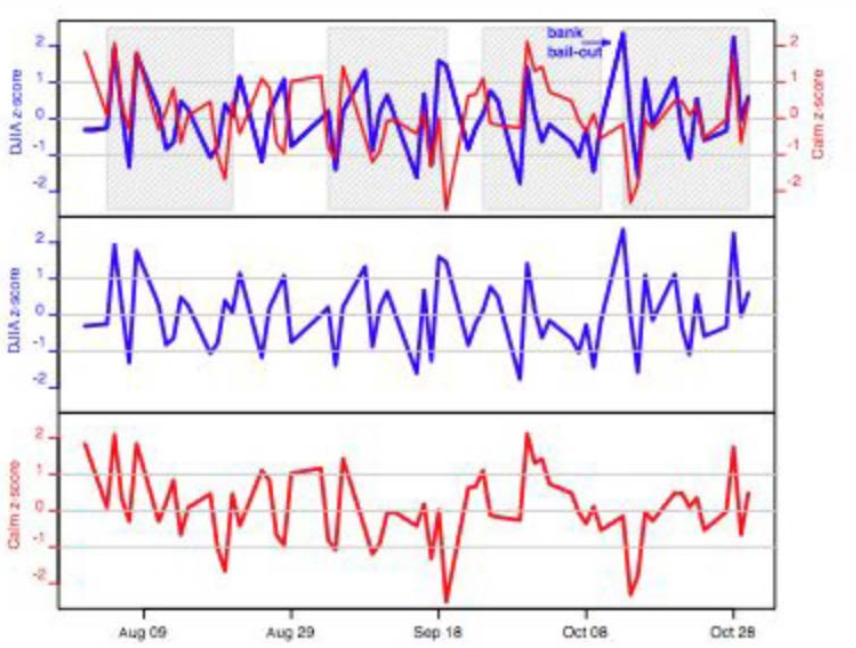
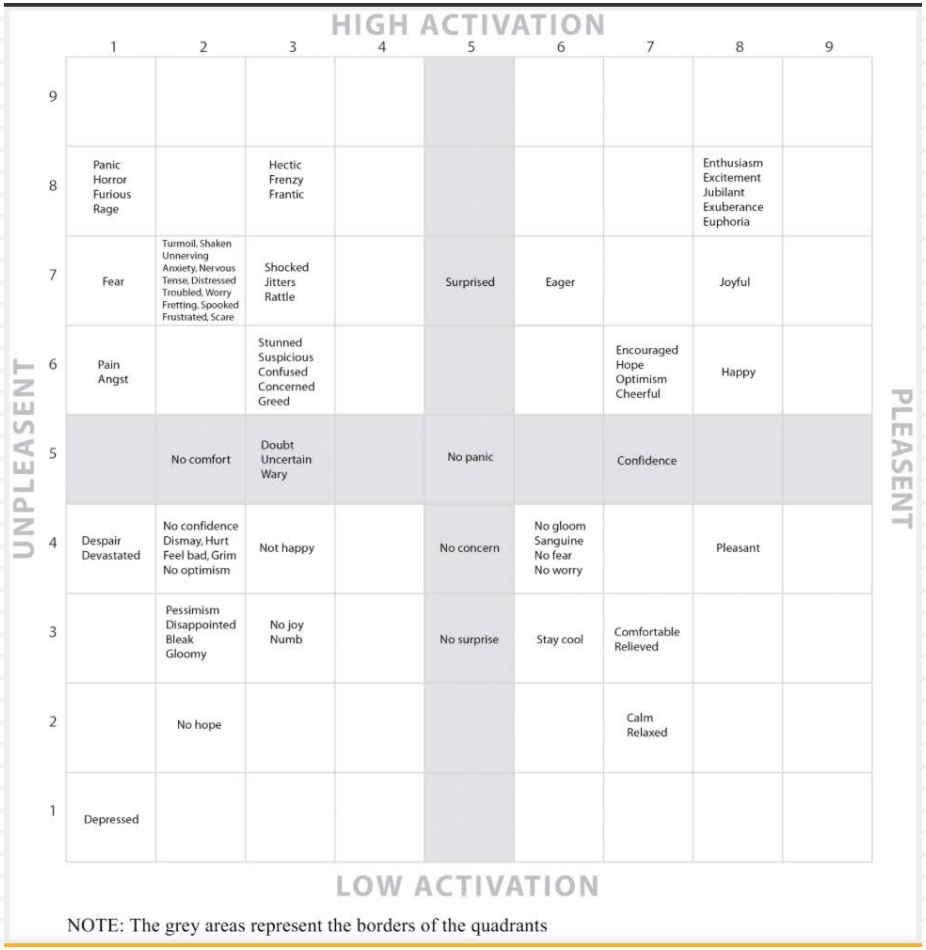


Fig. 3. A panel of three graphs. The top graph shows the overlap of the day-to-day difference of DJIA values (blue: $\mathbb{Z}_{D_t}$) with the GPOMS' Calm time series (red: $\mathbb{Z}_{X_t}$) that has been lagged by 3 days. Where the two graphs overlap the Calm time series predict changes in the DJIA closing values that occur 3 days later. Areas of significant congruence are marked by gray areas. The middle and bottom graphs show the separate DJIA and GPOMS' Calm time series.

Mood inducing words



And pricing consequences…

	Prior Day Closing Price Control		Pleasant Mood Univariate		Unpleasant Mood Univariate		Full Multivariate Model	
	$\hat{B}$	T-value	$\hat{B}$	T-value	$\hat{B}$	T-value	$\hat{B}$	T-value
Market								
Prior day closing price	−.001	−.61	−.002	−2.14*	.0008	4.47**	−.0003	−.20
Mood								
Pleasant mood			196.46	3.72**			345.49	6.45**
Unpleasant mood					−194.77	−6.25**	−235.72	−6.65**
Variance of dependent variable			13378		13378		13378	
Residual variance			12730		12634		11018	
% of Variance Modeled			4.84%		5.56%		17.64%	

Notes. N = 251 days of NASDAQ price data.
*p<.05.
**p<.01.
All analyses include ARIMA(3,0,3) terms.
doi:10.1371/journal.pone.0072031.t003

Word Search and Value Consequences

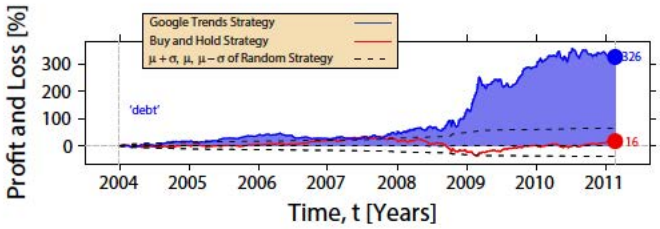
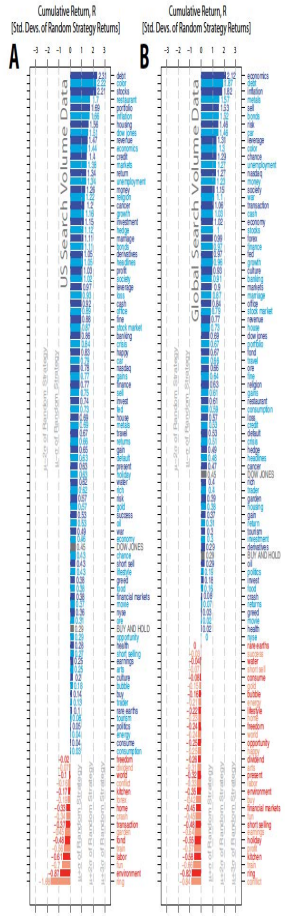
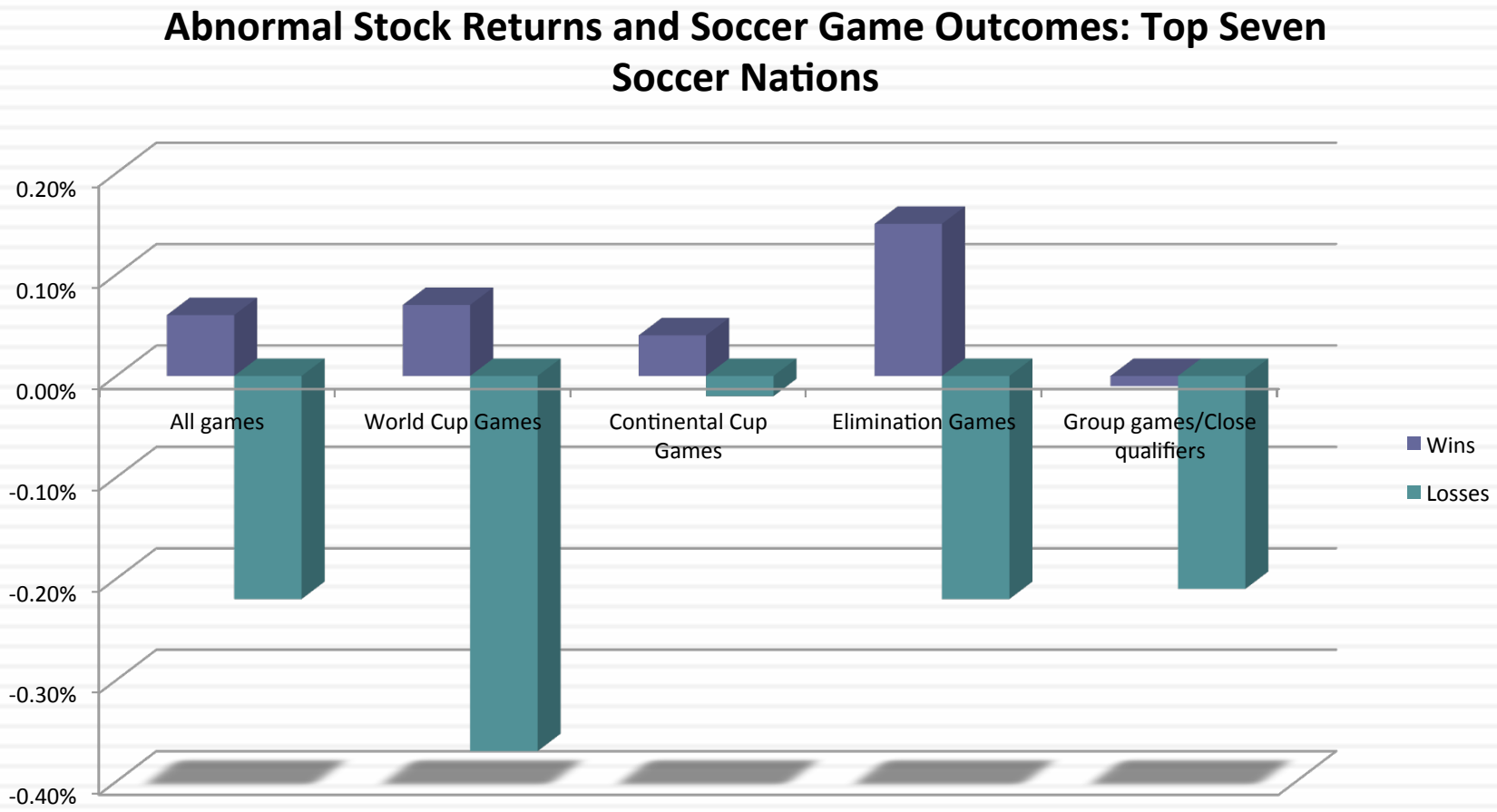


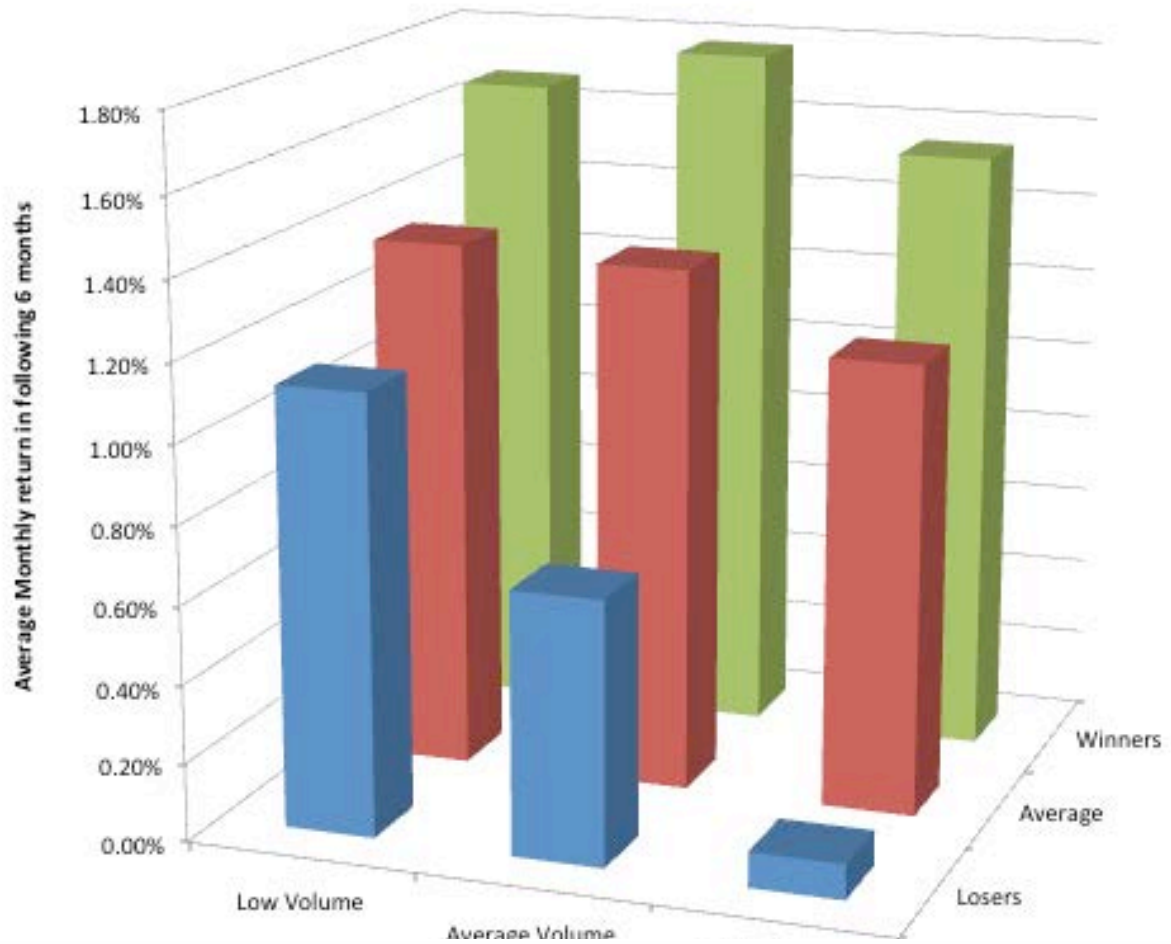
Figure 2 | Cumulative performance of an investment strategy based on *Google Trends* data. Profit and loss for an investment strategy based on the volume of the search term *debt*, the best performing keyword in our analysis, with $\Delta t = 3$ weeks, plotted as a function of time (*blue line*). This is compared to the "buy and hold" strategy (*red line*) and the standard deviation of 10,000 simulations using a purely random investment strategy (*dashed lines*). The *Google Trends* strategy using the search volume of the term *debt* would have yielded a profit of 326%.



Another mood experiment: The market and sporting outcomes

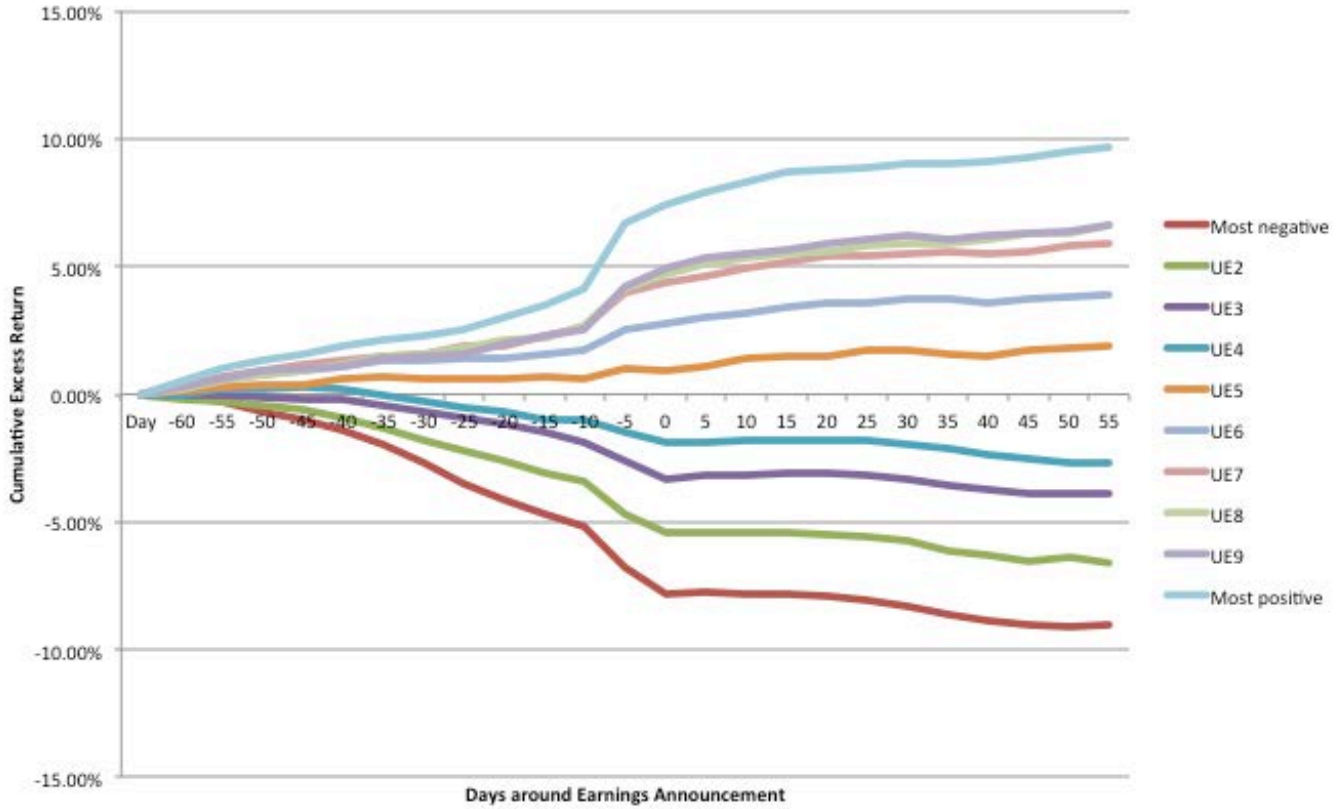


2. Liquidity & Volume

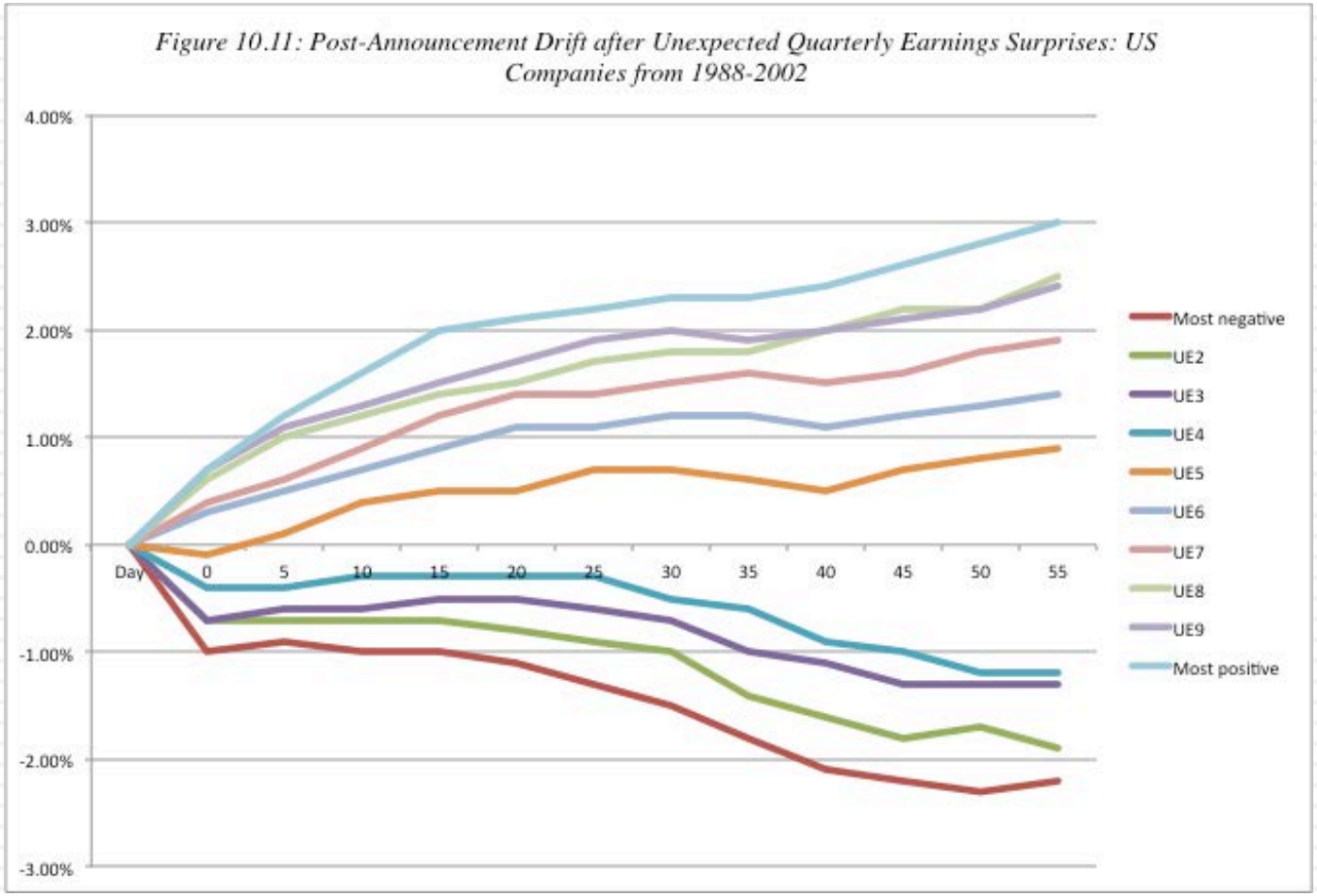


3. Incremental Information: Earnings Reports

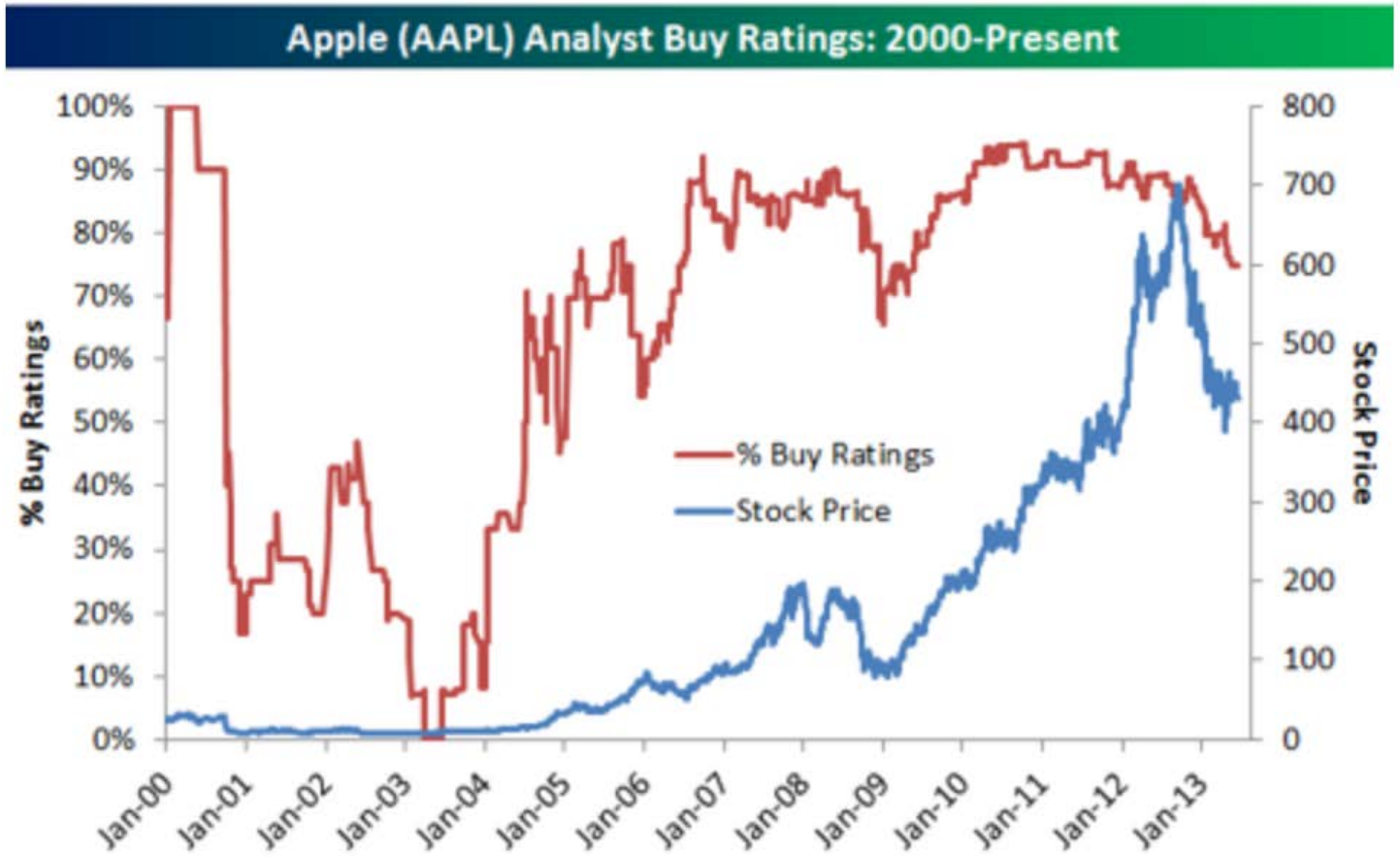
Figure 10.10: Market Reaction to Unexpected Quarterly Earnings Surprises: US Companies from 1988-2002



And the post-announcement drift

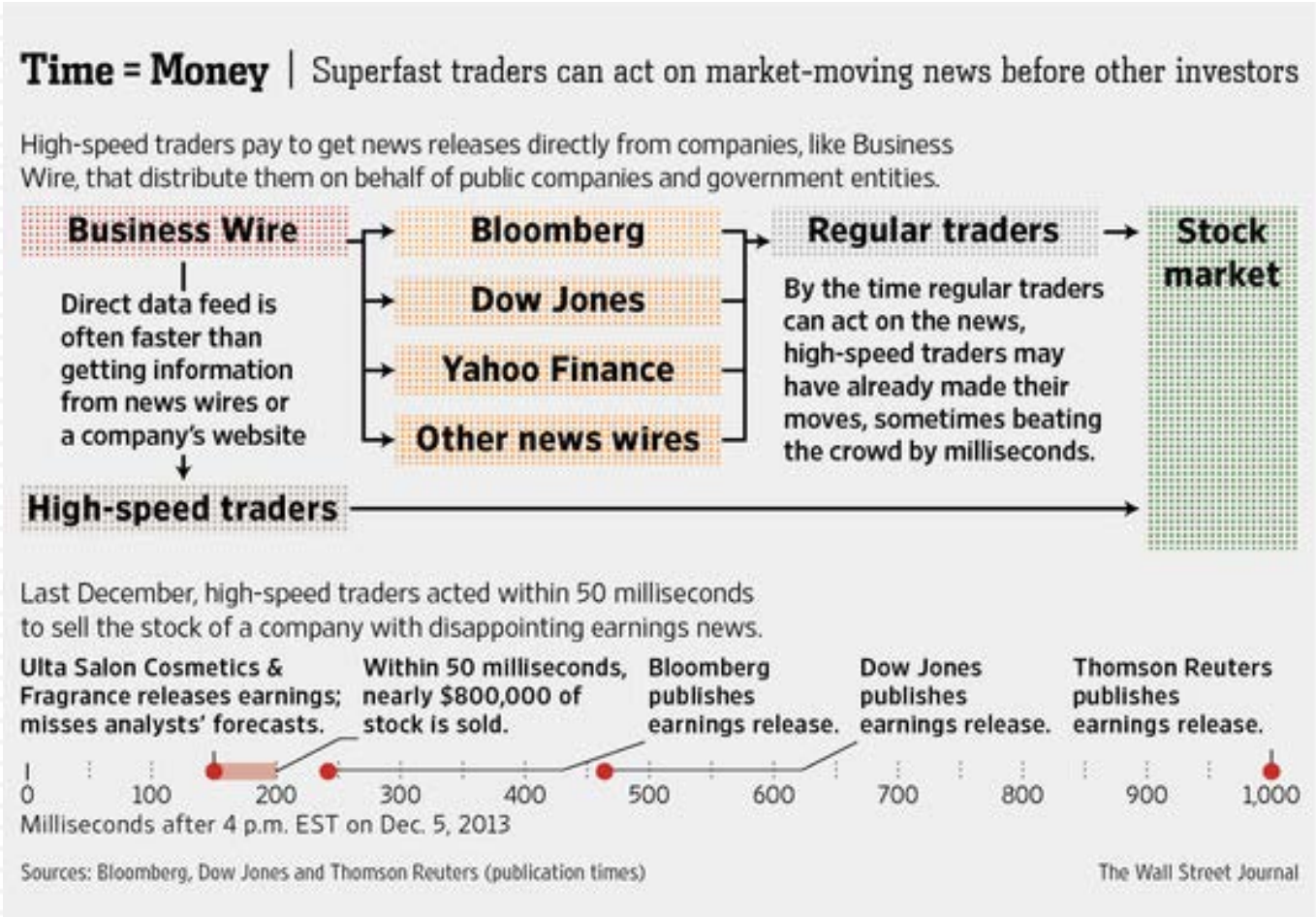


4. The Herd Mentality

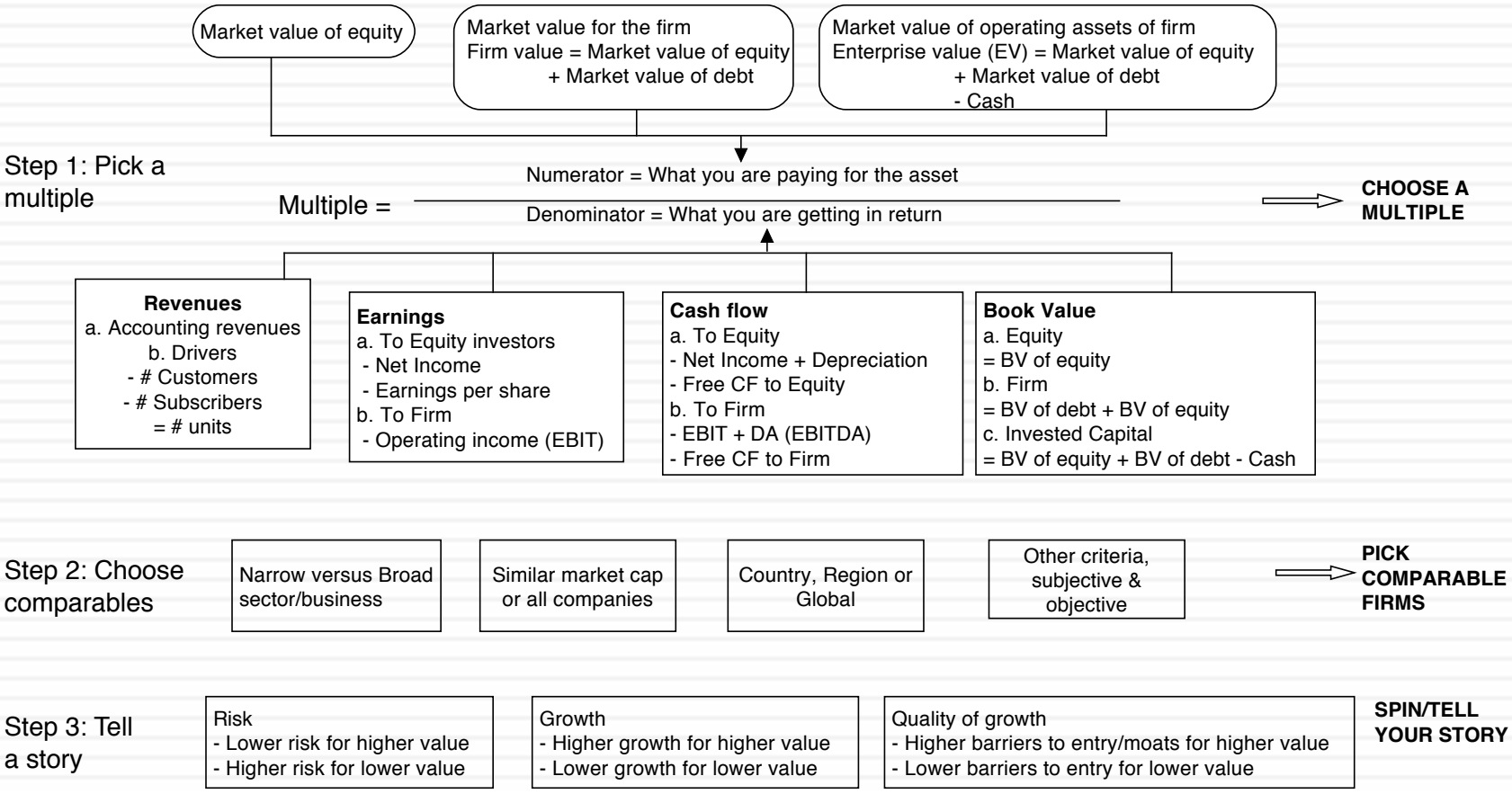


Tools for Pricing: Technical Analysis & Charting

And time is of the essence



A more general tool: Multiples and Comparable Transactions



Pricing Vale in May 2015

Compare to	*Number of firms*	*PE*	*PBV*	*EV/Sales*	*EV/EBITDA*	*EV/EBIT*	*EV/EBIT (1-t)*	*ROE*	*ROIC*
Large Mining	15	16.93	1.41	1.47	6.16	9.27	13.71	8.32%	9.82%
All mining	96	24.80	1.43	1.60	7.31	11.41	16.53	5.77%	8.16%
Large Steel	12	159.16	1.00	1.02	9.53	20.33	26.98	0.63%	3.81%
All Steel	110	92.67	1.24	1.05	9.77	18.87	25.79	1.34%	4.52%
Vale	**1**	**NA**	**0.60**	**2.30**	**8.03**	**17.7**	**17.7**	**-9.31%**	**4.41%**

Is Vale cheap or expensive? It depends on the multiple you use & who you compare it to..

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.

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

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.

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?

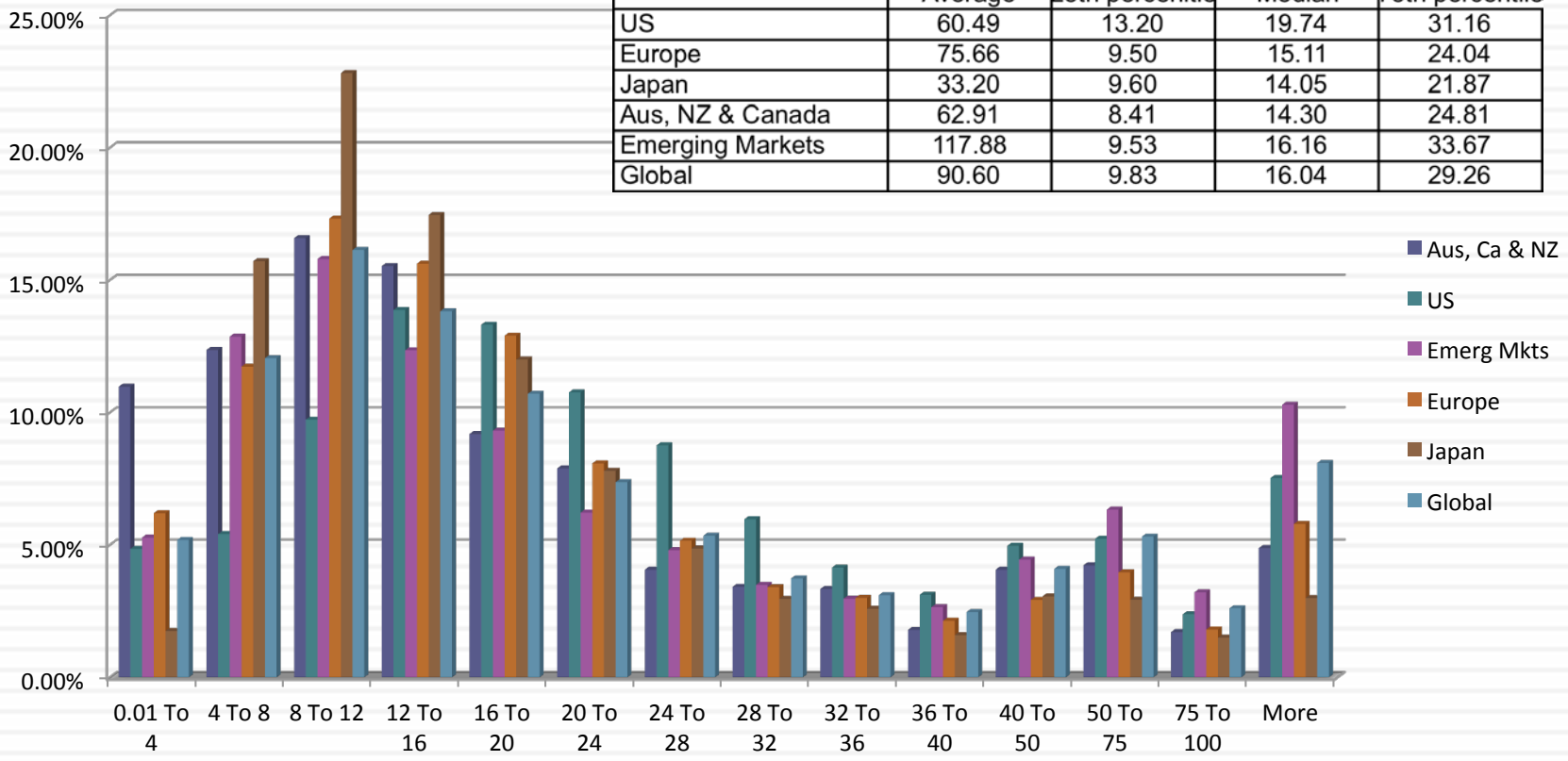
2. Play Moneyball: Let the numbers talk (not the analysts)

- 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…

PE Ratio Distribution: Global Comparison in January 2015

	Average	25th percenitle	Median	75th percentile
US	60.49	13.20	19.74	31.16
Europe	75.66	9.50	15.11	24.04
Japan	33.20	9.60	14.05	21.87
Aus, NZ & Canada	62.91	8.41	14.30	24.81
Emerging Markets	117.88	9.53	16.16	33.67
Global	90.60	9.83	16.04	29.26



Making statistics "dicey": US companies in 2015

	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

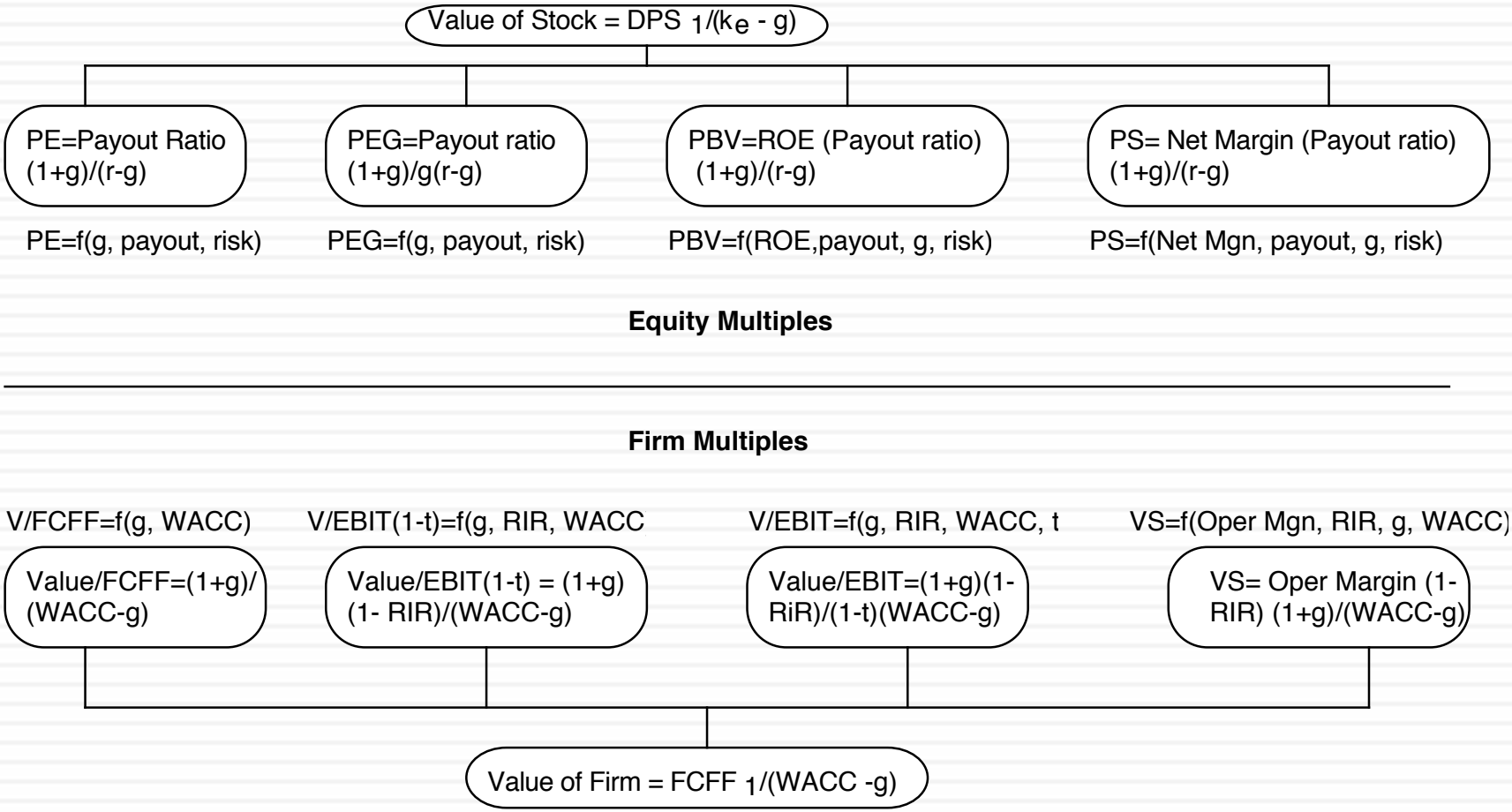
Firm Multiple

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…

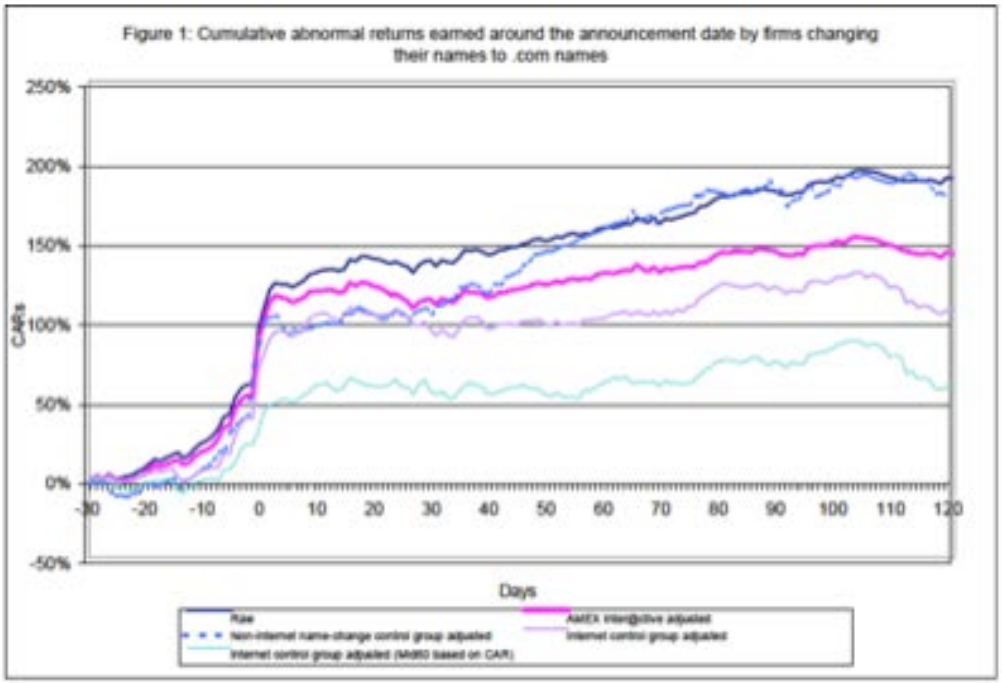


4. Define "comparable" broadly & control for differences

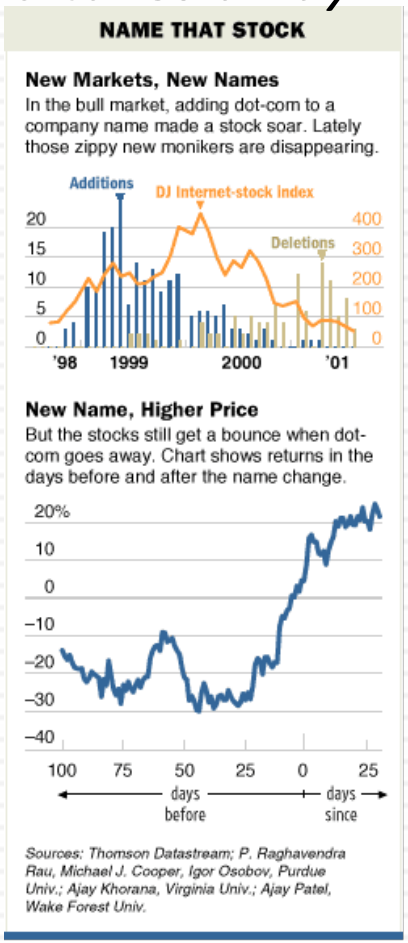
- Given the firm that we are valuing, what is a "comparable" firm?
  - While traditional analysis is built on the premise that firms in the same sector are comparable firms, valuation theory would suggest that a comparable firm is one which is similar to the one being analyzed in terms of fundamentals.
  - 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.

If your job is price enhancement….

The market gives…



And takes away….



PRICE OR VALUE
WHAT SHOULD YOU DO?

What's your game?

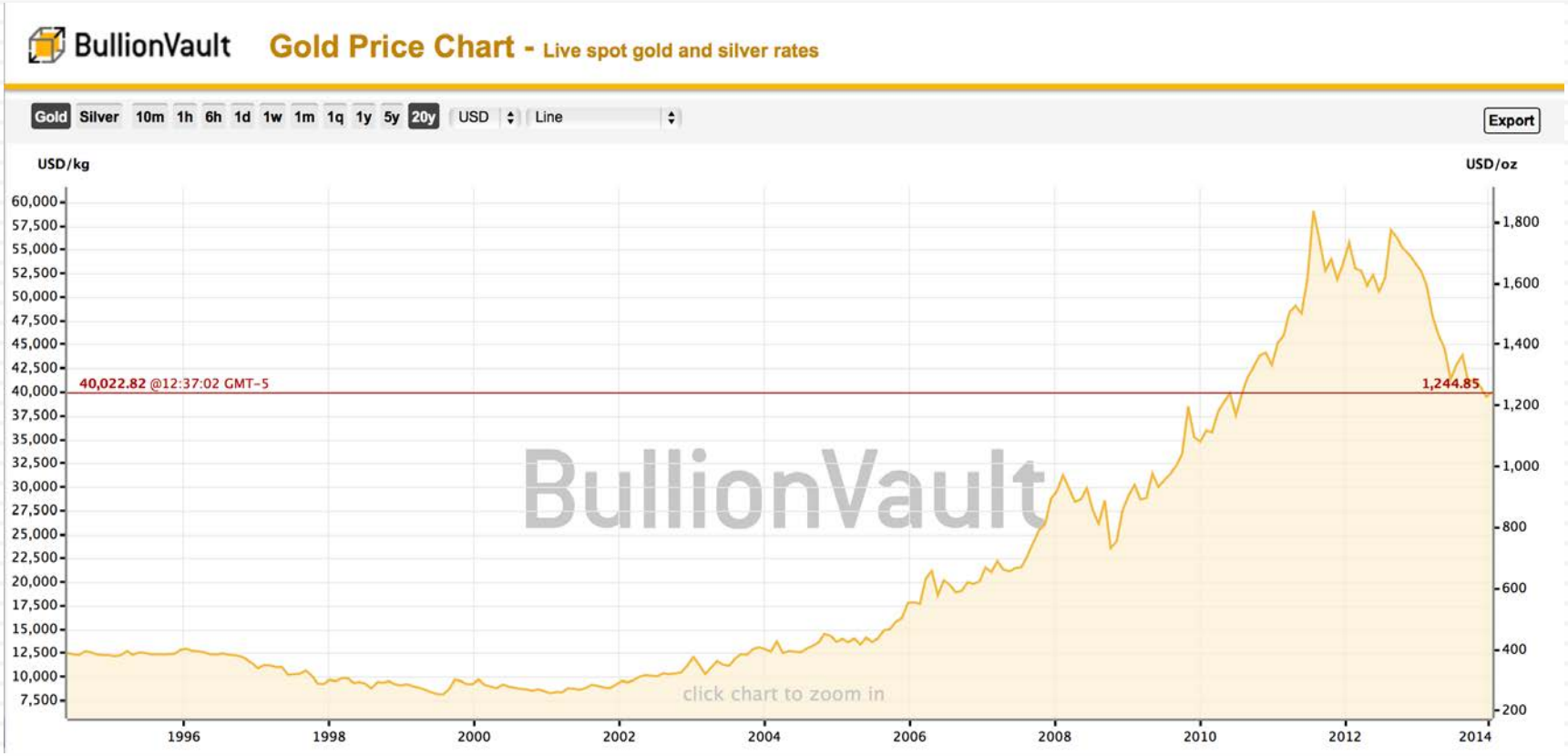
- The transactors
  - Traders: Oscar Wilde's definition of a cynic: "knows the price of everything, the value of nothing".
  - Salespeople: Caveat emptor!
  - Deal intermediaries: Get the deal done (even if it is not a good deal)!
- The muddled middle
  - Academic value: The cognitive dissonance of the "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.

Sometimes, you don't have a choice..

At $142.4 Million, Triptych Is the Most Expensive Artwork Ever Sold at an Auction

2013 Estate of Francis Bacon/Artists Rights Society (ARS), New York/DACS, London

A fair price for gold? How about value?



And for Bitcoins?

In the muddled middle, what you get is neither price nor value, but mush..

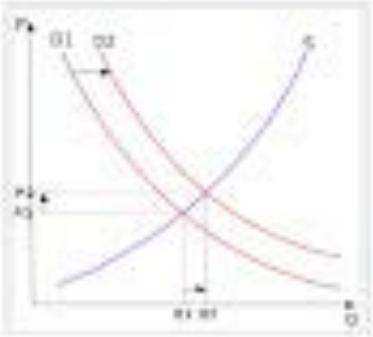
- The "fair value accounting" oxymoron: Fair value accounting requires accountants to value assets based upon what "market participants" will pay for those assets in arms length transactions today.
- Legal Valuation: In courts, experts witnesses are generally asked to opine on the values of assets, often 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 asset pricing in finance is exactly that: pricing.

The Gap

Tools for intrinsic analysis
- Discounted Cashflow Valuation (DCF)
- Intrinsic multiples
- Book value based approaches
- Excess Return Models

Tools for "the gap"
- Behavioral finance
- Price catalysts

Tools for pricing
- Multiples and comparables
- Charting and technical indicators
- Pseudo DCF



INTRINSIC VALUE → Value → THE GAP Is there one? Will it close? ← Price ← PRICE

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

Drivers of "the gap"
- Information
- Liquidity
- Corporate governance

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

In the investing world, there are three views of "the gap"

	View of the gap	Investment Strategies
The Efficient Marketer	The gaps between price and value, if they do occur, are random.	Index funds
The "value" extremist	You view pricers as dilettantes who will move on to fad and fad. Eventually, the price will converge on value.	Buy and hold stocks where value > price and hope that the gap closes.
The pricing extremist	Value is only in the heads of the "eggheads". Even if it exists (and it is questionable), price may never converge on value.	(1) Look for mispriced securities. (2) Get ahead of shifts in demand/momentum.

If you believe in efficient markets, there is no contradiction

- If you believe that markets are efficient, you are not arguing that there will never be gaps between price and value, but that if there are gaps, they are random and cannot be exploited by investors.
- If you buy into this notion, it is indeed appropriate to use price and value as interchangeable, since the market price is your best estimate of the value.

If you are a pure pricer (trader)

- Philosophy: The price is the only real number that you can act on. No one knows what the value of an asset is and estimating it is of little use.
- To play the game: You try to guess which direction the price will move in the next period(s) and trade ahead of the movement. To win the game, you have to be right more often than wrong about direction and to exit before the winds shift.
- Key skill: Be able to gauge market mood/momentum shifts earlier than the rest of the market.
- Time Horizon: Can be very short term (minutes) to mildly short term (weeks, months).
- Key personality traits: (a) Market amnesia, (b) Quick acting (c) Gambling instincts.
- Added Bonus: Capacity to move prices (with lots of money and lots of followers)

And here are your dilemmas..

- 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.

To be a pure valuer

- Philosophy: Every asset has a fair or true value. You can estimate that value, albeit with error, and price has to converge on value (eventually).
- To play the game: You try to estimate the value of an asset, and if it is under(over) value, you buy (sell) the asset. To win the game, you have to be right about value (for the most part) and the market price has to move to that value.
- Key skill(s): Be able to "value" assets, given uncertainty.
- Time Horizon: As long as it takes for market to correct their mistakes.
- Key personality traits: (a) Faith in "value" (b) Patience (c) immunity from peer pressure.
- Added Bonus: Can provide the catalyst that can move price to value.

And your dilemma…

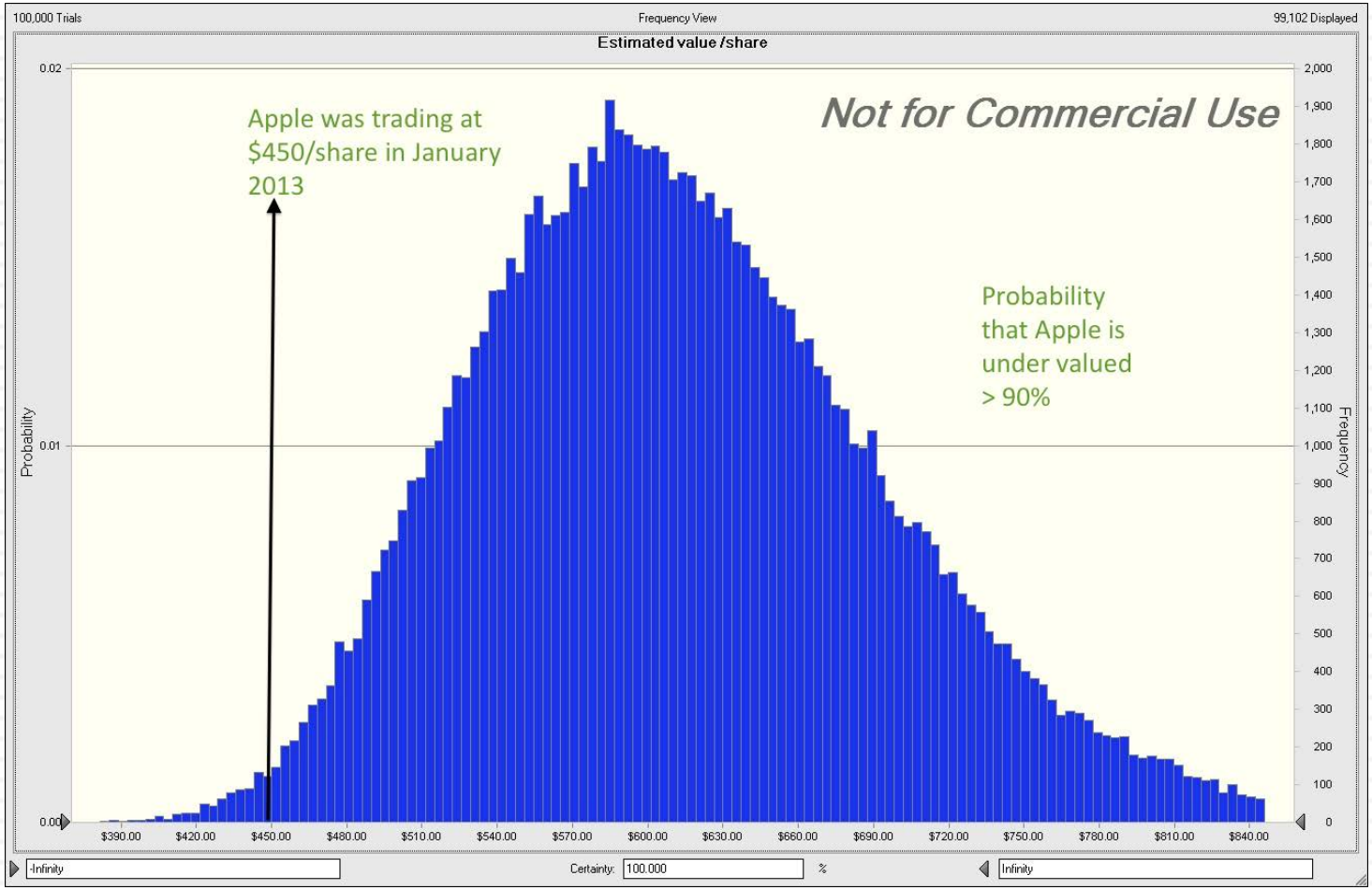
- Uncertainty about the magnitude of the gap:
  - Margin of safety: Many value investors swear by the notion of the "margin of safety" as protection against risk/uncertainty.
  - Collect more information: Collecting more information about the company is viewed as one way to make your investment less 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.

A case study: Apple in early 2013

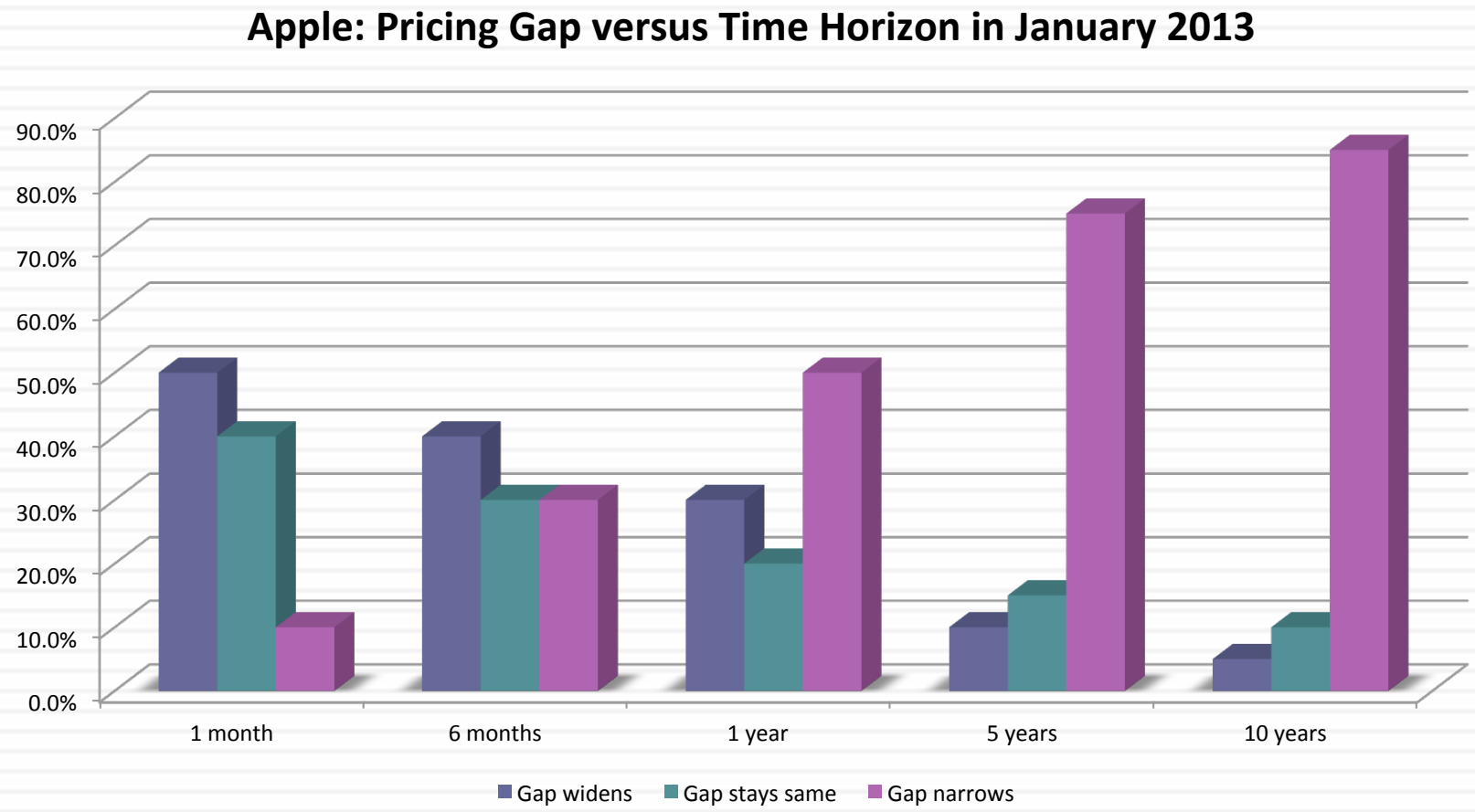
- Starting in September 2012, when the stock peaked at $700, the pricing mood turned sour at the company with the stock dropping to $450 by the end of January 2013.
- In January 2013, I valued the company at about $600/share, and suggested that it was significantly under valued.
- I also argued that investors were pricing the stock to deliver no growth and have rapidly declining margins and were then punishing the stock for delivering some growth and slowly declining margins.

	Last year	*Q2 2013*	*My estimate*	*Breakeven*
Revenue Growth Rate	44.58%	11.28%	5.00%	-5.00%
Operating Margin	35.30%	28.80%	25.00%	12.00%
Cost of capital	12.49%	11.29%	11.29%	21.00%

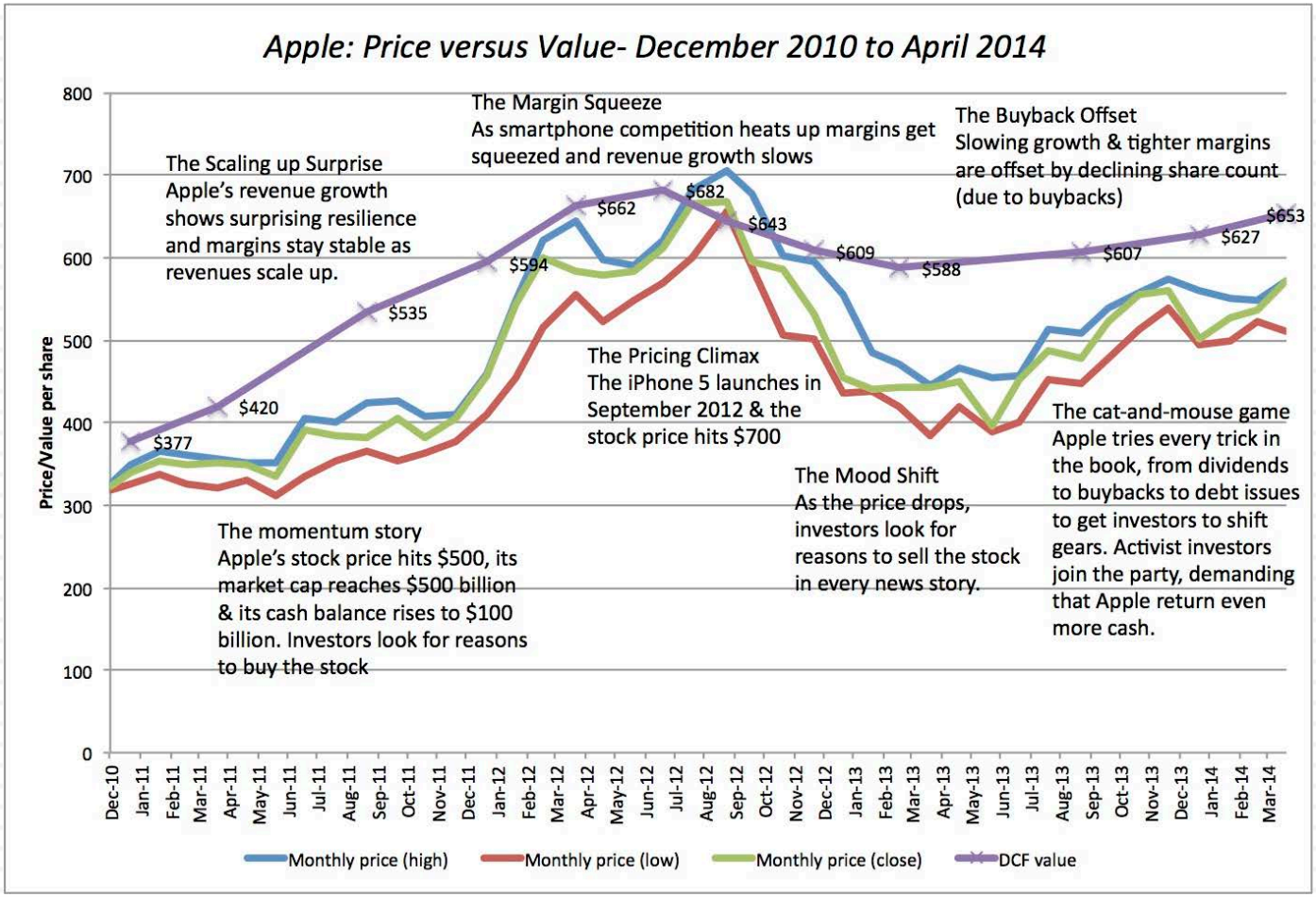
Apple: Visualizing uncertainty
A simulation of value in January 2013



Gap and Time Horizon: My estimates for Apple in January 2013



Watch the Gap! Apple updated through April 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

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…

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°

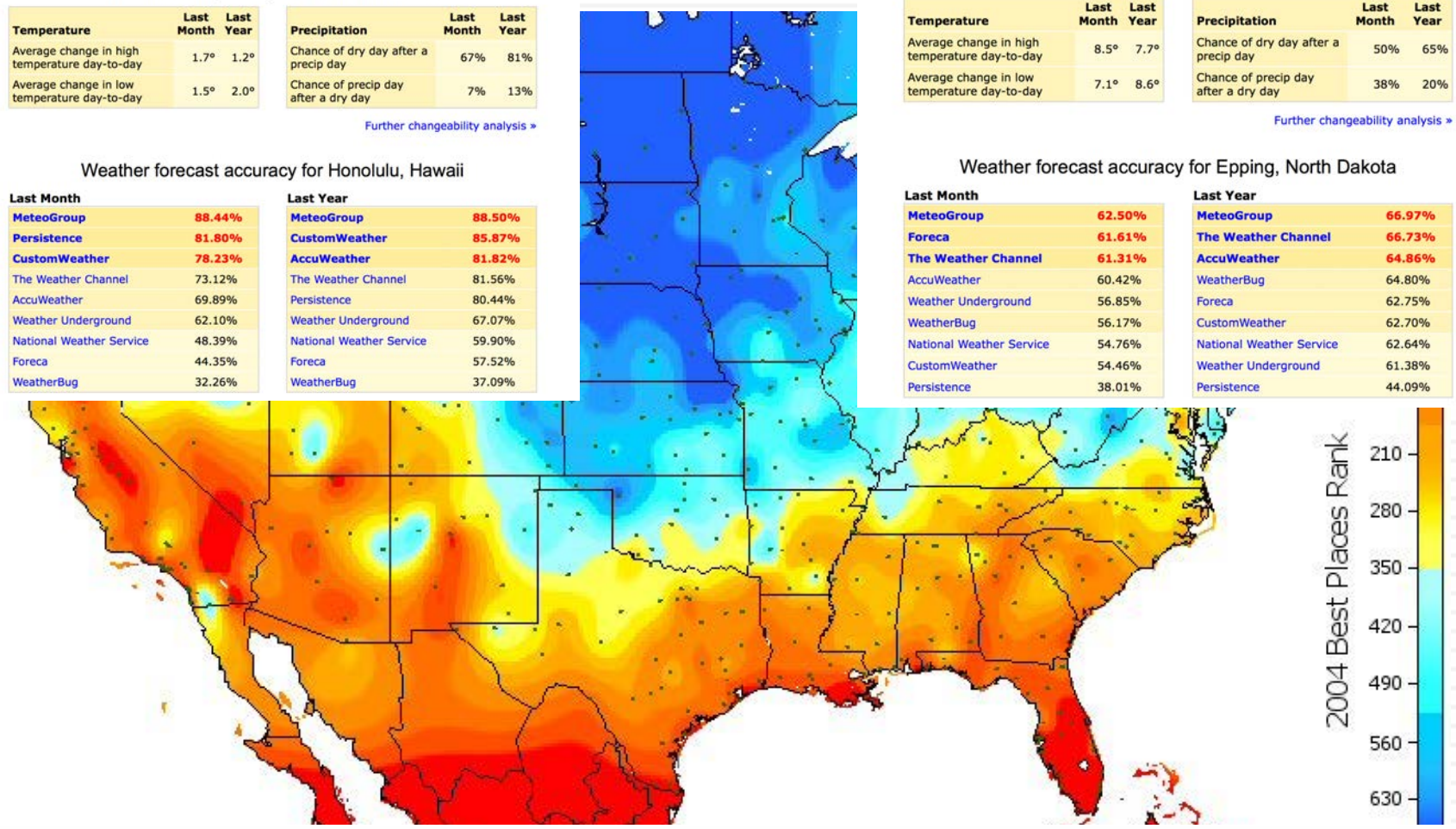
Precipitation	Last Month	Last Year
Chance of dry day after a precip day	50%	65%
Chance of precip day after a dry day	38%	20%

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%



Three rules for the road

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.

NUMBERS AND NARRATIVE: MODELING, STORY TELLING AND INVESTING

Aswath Damodaran

Let's start with an experiment

A valuation of Amazon in October 2014

A DCF valuation of Amazon

Amazon: A DCF valuation in late October 2014

Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

	Base year	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	Terminal year
Revenue growth rate		15.00%	15.00%	15.00%	15.00%	15.00%	12.44%	9.88%	7.32%	4.76%	2.20%	2.20%
Revenues	$ 85,246	$98,033	$112,738	$129,649	$149,096	$171,460	$192,790	$211,837	$227,344	$238,166	$243,405	$ 248,760
EBIT (Operating) margin	0.58%	1.26%	1.94%	2.62%	3.30%	3.98%	4.66%	5.34%	6.02%	6.70%	7.38%	7.38%
EBIT (Operating income)	$ 494	$ 1,235	$ 2,187	$ 3,397	$ 4,920	$ 6,824	$ 8,984	$ 11,312	$ 13,686	$ 15,957	$ 17,963	$ 18,358
Tax rate	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%
EBIT(1-t)	$ 337	$ 842	$ 1,492	$ 2,317	$ 3,356	$ 4,654	$ 6,127	$ 7,715	$ 9,334	$ 10,883	$ 12,251	$ 12,520
- Reinvestment		$ 3,474	$ 3,995	$ 4,594	$ 5,284	$ 6,076	$ 5,795	$ 5,175	$ 4,213	$ 2,940	$ 1,424	$ 2,755
FCFF		$ (2,632)	$ (2,504)	$ (2,278)	$ (1,928)	$ (1,422)	$ 332	$ 2,540	$ 5,121	$ 7,943	$ 10,827	$ 9,766
Terminal Value											$168,379	
Cost of capital		8.39%	8.39%	8.39%	8.39%	8.39%	8.32%	8.24%	8.16%	8.08%	8.00%	8.00%
PV(FCFF)		$ (2,489)	$ (2,189)	$ (1,842)	$ (1,446)	$ (994)	$ 169	$ 1,420	$ 2,681	$ 3,865	$ 80,918	

Operating margin improves to 7.38% in year 10, weighted average of retail & media businesses

Reinvest $1 for every $3.68 in additional revenues

PV(Terminal value)	$ 76,029
PV (CF over next 10 years)	$ 4,064
Value of operating assets =	$ 80,093
- Debt	$ 8,353
+ Cash	$ 10,252
Value of equity	$ 81,143
- Value of options	$ -
Value of equity in common stock	$ 81,125
Number of shares	463.01
Estimated value /share	$ 175.25
Price	$ 287.06
Price as % of value	163.84%

Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

A 'narrative' about Amazon

1. Continue high revenue growth: In valuing Amazon, I am going to assume that the company is going to continue on its path of growing revenues rapidly (high revenues), with media and cloud services adding to retail, to become the second largest retailer in the world.
2. By selling products at or below cost: In pursuit of this growth, Amazon will continue to give away its products and services at or below cost, leading to a continuation of low operating margins for the next few years.
3. Aspirations of using market power: Once Amazon reaches a dominant position, it will raise prices on products/ services but the ease with which new entrants can come into the business will act as a restraint on prices (keeping operating margins constrained in long term).
4. Low/different reinvestment: Amazon will have to invest in a mix of assets, including infrastructure, computing services, acquisitions and product development, but will be able to deliver more revenues/dollar investment than the typical retail firm.
5. Shifting risk profile: Amazon's risk profile will be a mix of retail, entertainment and business services as well as its geographic ambitions, and the technology twist to its business will keep debt ratios low (lower than brick and mortar retailers).

A quick test

- Now that you have been exposed to two different valuations of Amazon, one driven entirely by numbers and one set as a story, which one do you find more credible?
  a. The DCF valuation
  b. The Amazon story
- Which one are you more likely to remember tomorrow?
  a. The DCF valuation
  b. The Amazon story
- What would your biggest concern be with each one?

Marrying numbers & narrative

To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost. Operating margin stays low for the next few years.

Amazon will continue on its path of revenue growth first, pushing into media & cloud servies to become the second largest retailer in the world. Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

	Base year	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	Terminal year
Revenue growth rate		15.00%	15.00%	15.00%	15.00%	15.00%	12.44%	9.88%	7.32%	4.76%	2.20%	2.20%
Revenues	$85,246	$98,033	$112,738	$129,649	$149,096	$171,460	$192,790	$211,837	$227,344	$238,166	$243,405	$ 248,760
EBIT (Operating) margin	0.58%	1.26%	1.94%	2.62%	3.30%	3.98%	4.66%	5.34%	6.02%	6.70%	7.38%	7.38%
EBIT (Operating income)	$ 494	$ 1,235	$ 2,187	$ 3,397	$ 4,920	$ 6,824	$ 8,984	$ 11,312	$ 13,686	$ 15,957	$ 17,963	$ 18,358
Tax rate	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%
EBIT(1-t)	$ 337	$ 842	$ 1,492	$ 2,317	$ 3,356	$ 4,654	$ 6,127	$ 7,715	$ 9,334	$ 10,883	$ 12,251	$ 12,520
- Reinvestment		$ 3,474	$ 3,995	$ 4,594	$ 5,284	$ 6,076	$ 5,795	$ 5,175	$ 4,213	$ 2,940	$ 1,424	$ 2,755
FCFF		$ (2,632)	$ (2,504)	$ (2,278)	$ (1,928)	$ (1,422)	$ 332	$ 2,540	$ 5,121	$ 7,943	$ 10,827	$ 9,766
Terminal Value											$168,379	
Cost of capital		8.39%	8.39%	8.39%	8.39%	8.39%	8.32%	8.24%	8.16%	8.08%	8.00%	8.00%
PV(FCFF)		$ (2,489)	$ (2,189)	$ (1,842)	$ (1,446)	$ (994)	$ 169	$ 1,420	$ 2,681	$ 3,865	$ 80,918	

As Amazon becomes more dominant, it will increase prices, but easy entry into the business will act as a restraint. Operating margin improves to 7.38% in year 10, weighted average of retail & media businesses

Amazon will be able to invest more efficiently that the average retailer. Reinvest $1 for every $3.68 in additional revenues

PV(Terminal value)	$ 76,029
PV (CF over next 10 years)	$ 4,064
Value of operating assets =	$ 80,093
- Debt	$ 8,353
+ Cash	$ 10,252
Value of equity	$ 81,143
- Value of options	$ -
Value of equity in common stock	$ 81,125
Number of shares	463.01
Estimated value /share	$ 175.25
Price	$ 287.06
Price as % of value	163.84%

Amazon's technology twist will keep financial leverage low: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

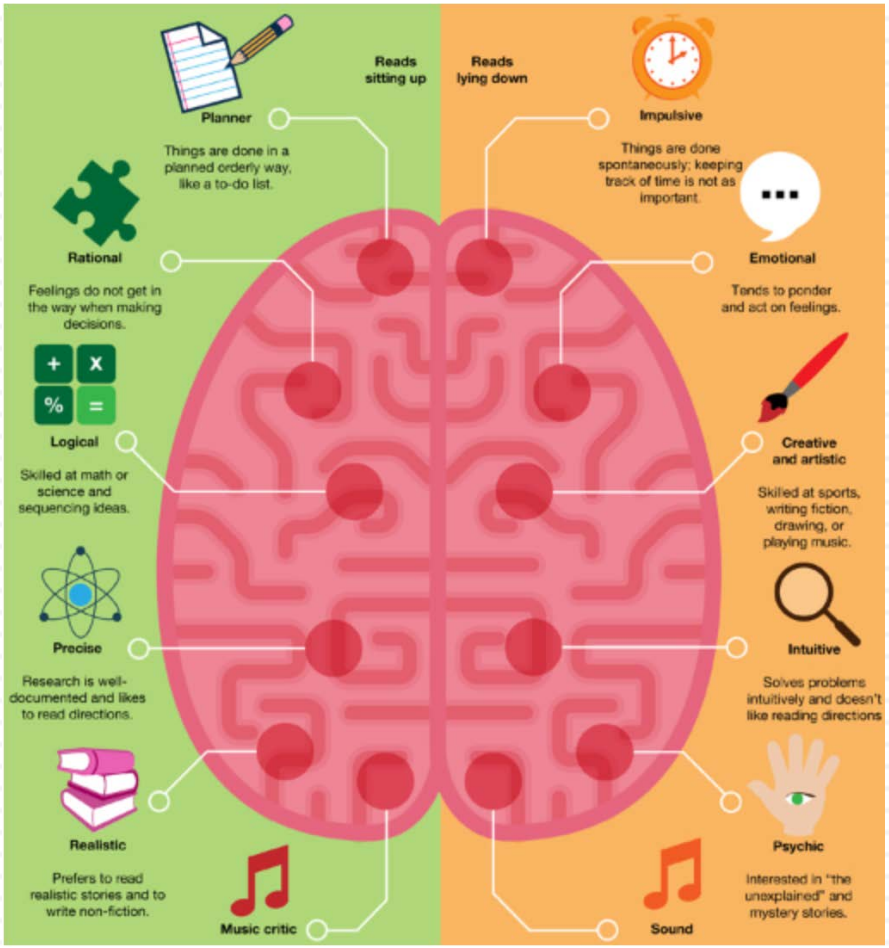
Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

Amazon: A DCF valuation in late October 2014

Numbers person or Story teller?

Vive le difference!

Left Brain and Right Brain



Different styles of thinking?

The side of the brain we tend to use more may determine our learning styles, not to mention instructors' teaching methods:

LEFT SIDE

Linear
Processes information by taking pieces, lining them up, and arranging them in a logical order to draw conclusions.

Sequence
Processes information in order. This makes for easy daily planning and accomplishing tasks.

Reality-based
Deals with reality the way it is. When affected by the environment, adjustment can be easily made.

$$f(x)=\frac{x}{3}+5$$

Symbolic
Processing symbols is no problem such as letters, words, and mathematical notation.

RIGHT SIDE

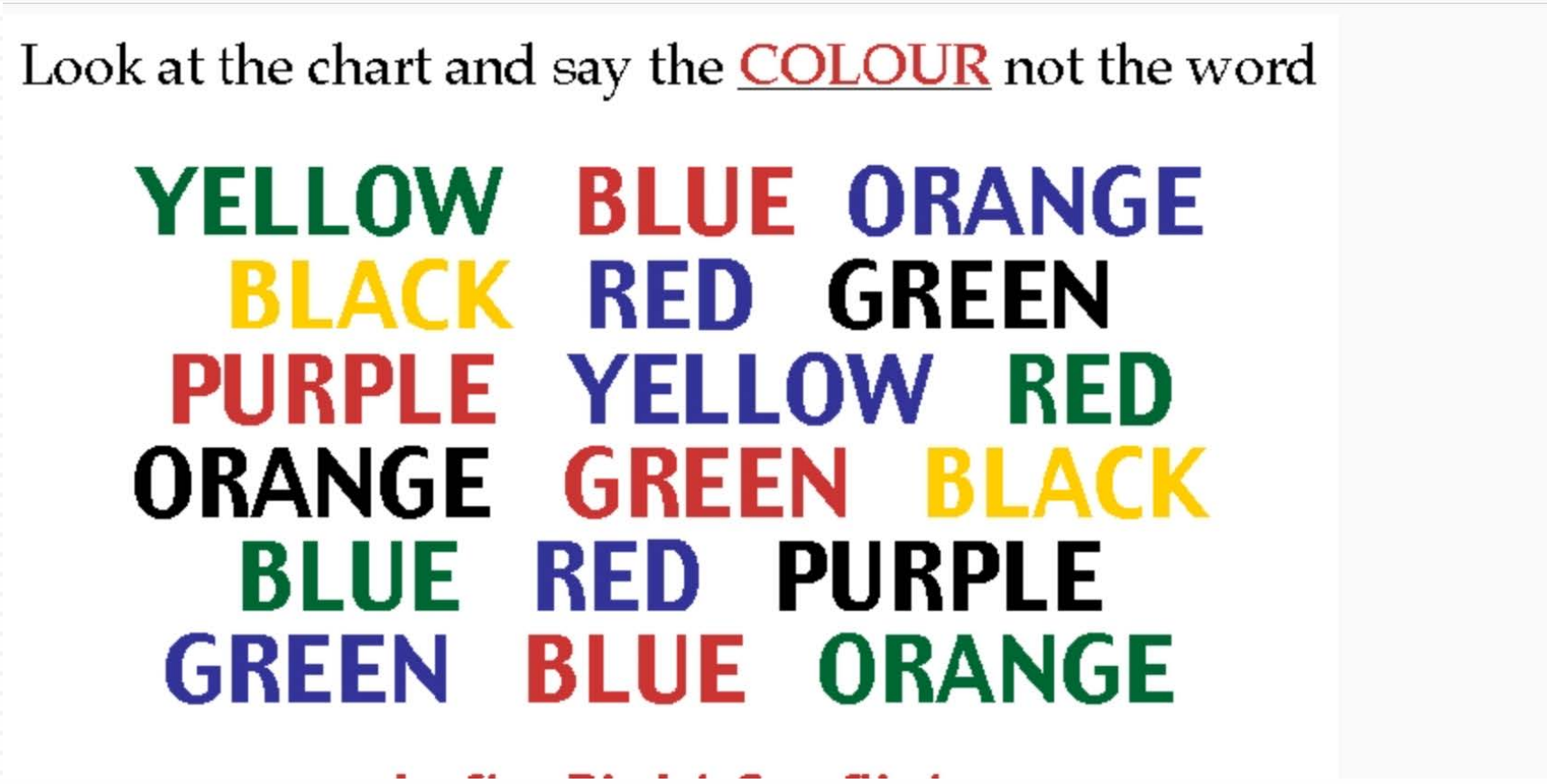
Holistic
Processes information by starting with the answer. It sees the big picture first, not the details.

Random
Processes information through random processing. Tasks are done randomly and in parts.

Fantasy-oriented
Processes information based on what they think the answer is. Often they find the answer intuitively.

Concrete
Processing requires things to be concrete such as feeling, seeing, or touching the real object.

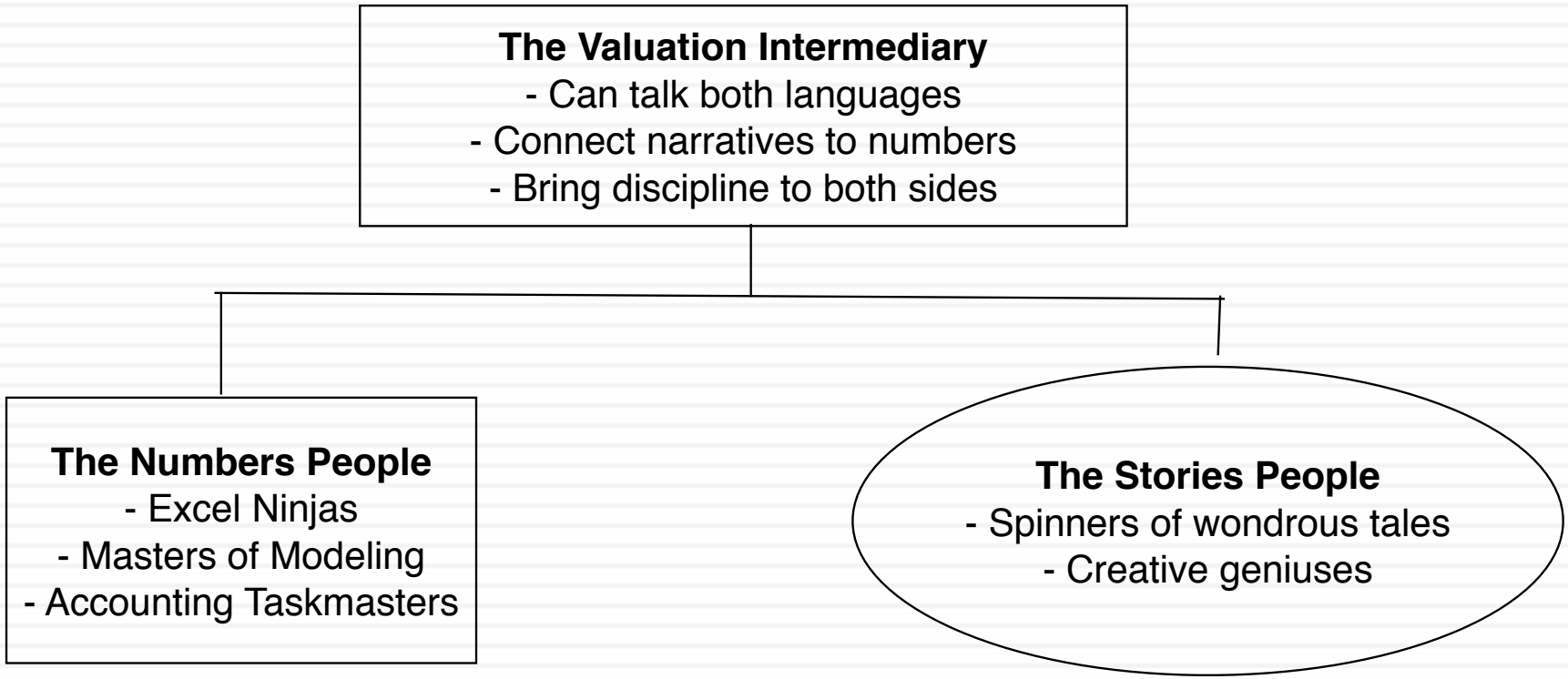
Which side of your brain is stronger? A test..



Setting up the contrast

”Jargon seems to be (the only place) where the right brain and the left brain meet”

The Set Up


The Valuation Intermediary
- Can talk both languages
- Connect narratives to numbers
- Bring discipline to both sides
The Numbers People
- Excel Ninjas
- Masters of Modeling
- Accounting Taskmasters
The Stories People
- Spinners of wondrous tales
- Creative geniuses

Dueling Perspectives

- Numbers people believe that valuation should be about numbers and that narratives/stories are distractions that bring in irrationalities into investing.
- Narratives people believe that valuation and investing is really about great stories and that it is the height of hubris to try to estimate numbers, when you face uncertainty.

The Great Divide

- They speak different languages: Numbers and narrative people speak different languages and often don't understand what the other side is saying.
- Each side thinks it occupies the high ground: Each side thinks that it occupies the high ground and believes in the worst caricatures it can of the other side.

The Numbers People

Just the facts, ma’am!

The Numbers Game: The building blocks

- Accounting: The game starts with accounting statements, with more value to greater detail. Not only is every piece of the accounting statement taken apart, but so is every footnote. FASB pronouncements are studied like the scriptures, parsed for meaning.
- Modeling: The next step is modeling the company, again in as much depth as possible.
- Data: Judgments based on data are valued more than judgments based upon intuition or experience.
- Valuation: The final aspect is valuation, with mastery of model mechanics equating to better valuation.

1. Accounting Mission Creep

- Accounting earnings are viewed as measures of economic earnings: Accounting measures of earnings at every level (EBITDA, operating income and net income) are given special respect and treat them as economic earnings.
- Accounting book value for assets is treated as having significant meaning, used by some as a proxy for invested capital in a business and by others as a measure of fair value in the business.
- Accounting rule makers are considered the arbiters of that which is right and reasonable.

2. The power of modeling

1. More/Bigger is better: More line items are viewed as better than less, and detail is a proxy for precision.
2. Excel is King: Mastering Excel is considered not only a critical step in understanding valuation but often the only step. In this world,
    a. Macros are good.
    b. Keyboard shortcuts are what separate exceptional analysts from average ones.

3. Data: Playing Billy Beane

- Data is plentiful: This trend is reinforced by the amount of data that we have available and the ease with which we can access that data.
- Successful role models: In the age of Moneyball and Nate Silver, there is special respect for those whose views are data driven. They are viewed as more objective and less driven by rules of thumb/traditions.
- Statistics 101: Statistics is designed to make sense of large and contradictory data, and it seems almost tailor-made for the problems we face in valuation and investing.

4. The Valuation Fix

- Valuation Certifications: As the alphabet soup of certifications increases (CFA, CVA etc.), there is a sense that your valuation expertise increases proportionally with the number of certifications after your name.
- The DCF God: It is almost an article of faith in legal circles, accounting rule making bodies and banks that a DCF valuation is the only way to estimate value.
- D+ CF = DCF: If you have a D(iscount rate) and a C(ash) F(low), you have a DCF.

The delusions of the number crunchers

- The illusion of precision: If you use numbers, you are being more precise than when you don't, and the more numbers you use, the more precise you become.
- The illusion of "no bias": Numbers don't lie and data does not have an agenda. Thus, analysts who use numbers are more likely to be unbiased.
- The illusion of control: If you put a number on something (your cash flows, expected growth rate, risk etc.), you can control it better.

All numbers, all the time: The dangerous limits

- Boring and unconvincing (but intimidating): A valuation that is all numbers and no narrative will not draw in skeptics or convince investors. It may intimidate them (and that may very well be the reason you use them).
- Miss internal inconsistencies: By letting your valuation be all about the numbers, you may miss a chance at spotting internal inconsistencies or serious problems.
- The Echo Chamber: If you are surrounded by other numbers people (quants), it becomes easy to find agreement about using valuation practices that may be patently wrong or are noisy.

The Story People

"You're never going to kill storytelling, because it's built into the human plan. We come with it."

The Narrative Game

- In the narrative game, you have a story to tell about an investment and if it has enough of a hook to it, hope to draw investors into the investment.
- You are measured by how well your story is structured and how you tell it, rather than the numbers that may or may not be backing it.
- At best, the numbers, if they are used, are almost an after thought at the end of the story, rather than being tied to the story.

1. The power of the anecdote

- Research in psychology point to an undeniable fact. Human beings respond better to stories than to abstractions of numbers. That reflects evolution, and as one psychologist put it, "*our brains our belief engines that employ association learning to seek and find patterns*". Anecdotal evidence is as old as man, but the scientific method is only a few hundred years in the making.
- This is true in business as well, where story telling often is much more effective at selling people on an investment than the numbers that may be presented.
- In business education, the use of cases shows the power of story telling in conveying larger themes. More generally, as a teacher, I am well aware of the power of good anecdote to back up theory, models or science.

2. The weight of experience

- Building on the theme of story telling, a story told by someone who was part of it is viewed as much more credible than one told by someone from the outside. And success in the past experience is viewed as a predictor of future success, even if it is not.
- And psychological studies indicate that it can affect choices. Quoting, "In the **case of decisions from description, people make choices as if they overweight the probability of rare events**, as described by prospect theory. We found that **in the case of decisions from experience, in contrast, people make choices as if they underweight the probability of rare events**".

3. The appeal to emotions/ common sense

- The best stories have emotional pulls, that drag listeners in because they can relate to that emotion.
- The emotions that these stories appeal to are generally a mix of the crass (greed, envy) and the noble (change the world, do good, alter the (bad) status quo).

The delusions of the story tellers

1. Number crunchers don't dream in technicolour: Creativity and Numbers are mutually exclusive. If you talk about numbers, you cannot be creative, and if you are being creative, talk about numbers only crimps your creative instincts.
2. Creativity is deserving of reward: If your story is good, your business will success and your investment will pay off.
3. Experience is the best teacher: If you have pulled this off before (started and succeeded at running a business), your story is more believable.

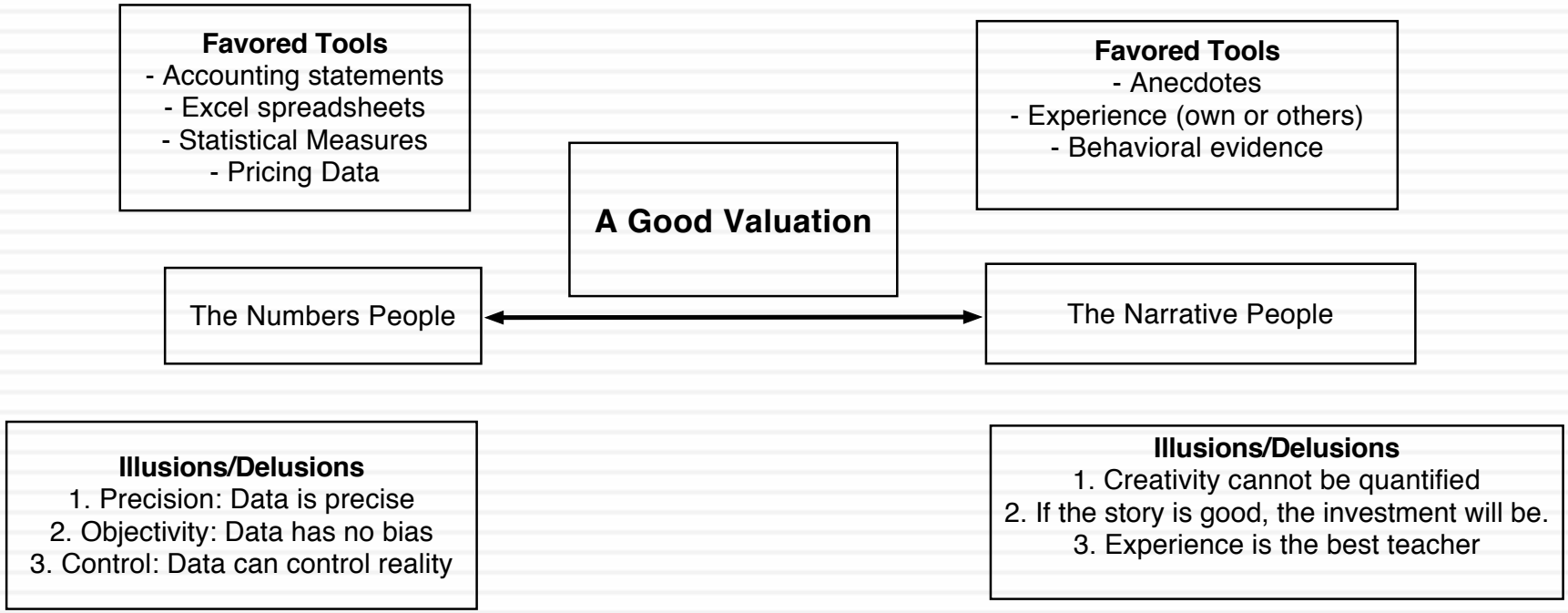
All narrative, all the time: The dangerous limits

- Fantasyland & Fairy tales: A narrative-based valuation, which has little, if any, numbers to back it up, can very quickly veer away from reality into fantasy.
- The Echo Chamber: If your circle is filled with people who are also unconstrained story tellers, not only do you feed on each other, but the stories tend to get more and more fantastic.
- No measurement mechanism or feedback look: If you don't use numbers in any meaningful way to sell an investment, you have no way of measuring whether your narrative is holding up and what you might need to do to set it right, if it is not.

Valuation as a bridge

"Be transparently wrong than opaquely right"

Bridging the Gap

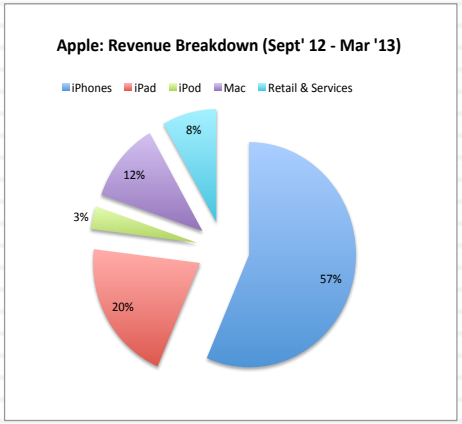


Step 1: Survey the landscape

- Before we start weaving narratives about a company's future, it behooves us to first understand the company's business model and where it stands right now (in terms of financials, business mix and the story).
- That understanding will require
  - Looking through financial statements
  - Assessing the overall market and competitors today
  - Trying out or talking to people involved: employees involved in producing the product/service as well as users.

Apple's financial balance sheet: April 23, 2013

Revenues tilting towards smartphones. Revenue growth is slowing & margins are shrinking.



Rumors of new products (iTV, iWatch) continue, but "market" optimism about introduction/success have faded. (See market cap to right)

Assets

1. Operating Businesses: Existing
    a. Computers & Peripherals
    b. Smartphones & Tablets
    c. Retail & Services
2. *Value of growth potential*
3. Cash

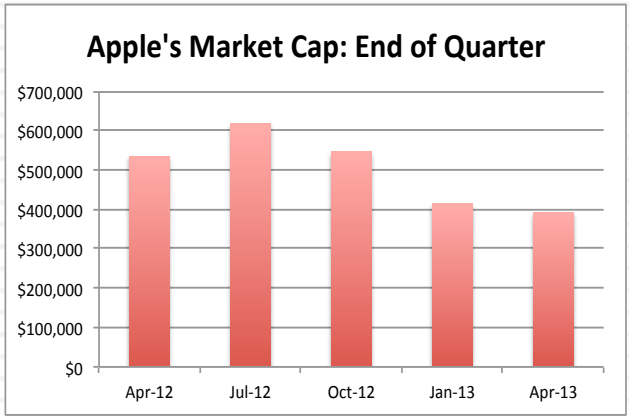
Cash balance has climbed by $35 billion in last 6 months to hit $145 billion. In April 2013, the cash balance was 35% of the value of the company.

Liabilities

Debt

Company has never used conventional debt. It has a small lease commitment.

Equity



Apple's market capitalization dropped by more than $200 billion between July 2012 and April 23, 2013

Twitter: Current Financials and Potential Market

Twitter's Income Statement

	2010	*2011*	*2012*	*2012 (6 mths)*	*2013 (6 mths)*	*Trailing 12 months*
Revenues	$28.3	$106.3	$316.9	$122.4	$253.6	$448.2
R&D expenses	$29.3	$80.2	$119.0	$46.3	$111.8	$184.5
Operating income	-$67.5	-$127.4	-$77.1	-$47.0	-$62.8	-$92.9
Operating income adjusted for R&D & Leases					$4.3	
Adjusted EBITDA (Net Loss+Taxes+Int exp+ Depr+Stock-based employee compensation)	-$51.2	-$42.8	$21.2	$6.7	$21.4	$35.9

The Online Advertising Market

	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

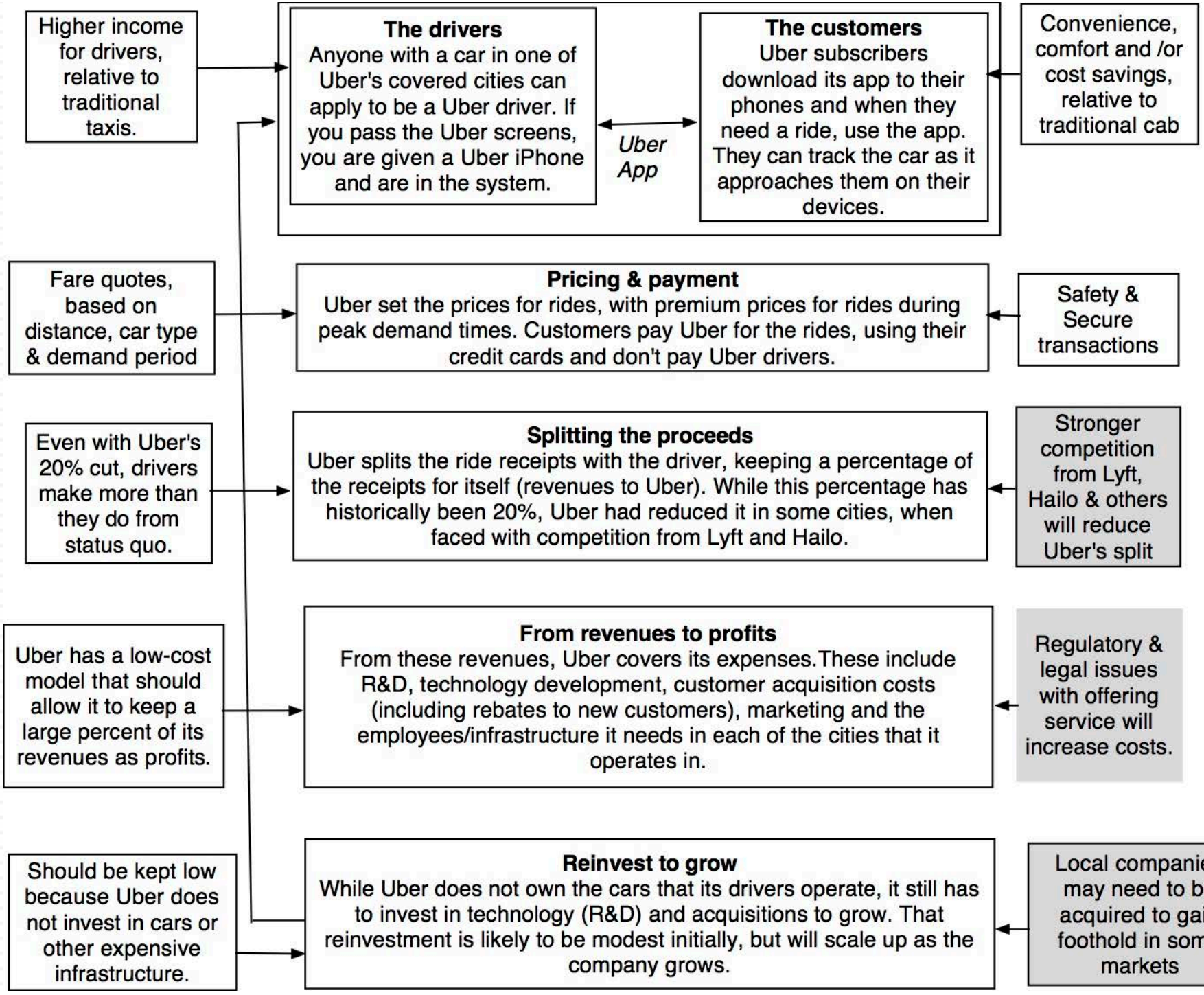
		Annual growth rate in Global Advertising Spending				
		2.00%	2.50%	3.00%	3.50%	4.00%
Online advertising share of market	20%	$124.78	$131.03	$137.56	$144.39	$151.52
	25%	$155.97	$163.79	$171.95	$180.49	$189.40
	30%	$187.16	$196.54	$206.34	$216.58	$227.28
	35%	$218.36	$229.30	$240.74	$252.68	$265.16
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

Twitter's Balance Sheet

	2011	2012	2013: Qtr 2	2013: Pro forma
Cash & ST Investments	$549.5	$424.9	$375.0	$375.0
Property & Equipment	$61.9	$185.6	$242.6	$242.6
Intangible assets	$6.4	$3.8	$14.4	$14.4
Goodwill	$36.8	$68.8	$163.7	$163.7
Capitalized R&D				*$248.7*
Total Assets	**$720.7**	**$831.6**	**$964.1**	**$964.1**
Capital Leases	$21.1	$65.7	$80.1	$80.1
Capitalized Op Leases				*$127.1*
Preferred Stock	$835.1	$835.4	$835.4	$0.0
Shareholders equity	-$201.8	-$248.2	-$164.4	$716.9

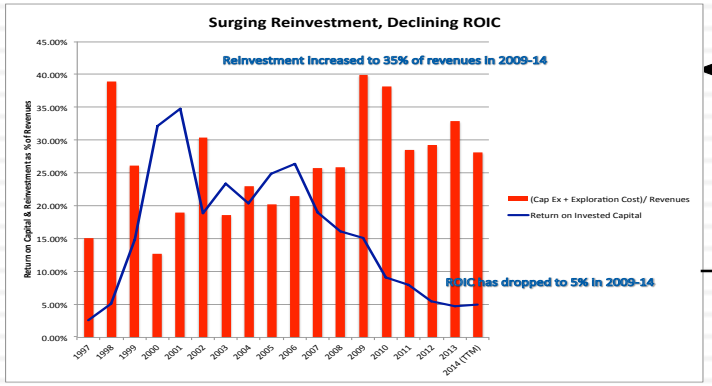
Twitter Users

Company	*No of users*
Facebook	1110
Google	1093
LinkedIn	225
Twitter	240


Higher income for drivers, relative to traditional taxis.
The drivers
Anyone with a car in one of Uber's covered cities can apply to be a Uber driver. If you pass the Uber screens, you are given a Uber iPhone and are in the system.
Uber App
The customers
Uber subscribers download its app to their phones and when they need a ride, use the app. They can track the car as it approaches them on their devices.
Convenience, comfort and /or cost savings, relative to traditional cab
Fare quotes, based on distance, car type & demand period
Pricing & payment
Uber set the prices for rides, with premium prices for rides during peak demand times. Customers pay Uber for the rides, using their credit cards and don't pay Uber drivers.
Safety & Secure transactions
Even with Uber's 20% cut, drivers make more than they do from status quo.
Splitting the proceeds
Uber splits the ride receipts with the driver, keeping a percentage of the receipts for itself (revenues to Uber). While this percentage has historically been 20%, Uber had reduced it in some cities, when faced with competition from Lyft and Hailo.
Stronger competition from Lyft, Hailo & others will reduce Uber's split
Uber has a low-cost model that should allow it to keep a large percent of its revenues as profits.
From revenues to profits
From these revenues, Uber covers its expenses.These include R&D, technology development, customer acquisition costs (including rebates to new customers), marketing and the employees/infrastructure it needs in each of the cities that it operates in.
Regulatory & legal issues with offering service will increase costs.
Should be kept low because Uber does not invest in cars or other expensive infrastructure.
Reinvest to grow
While Uber does not own the cars that its drivers operate, it still has to invest in technology (R&D) and acquisitions to grow. That reinvestment is likely to be modest initially, but will scale up as the company grows.
Local companies may need to be acquired to gain foothold in some markets

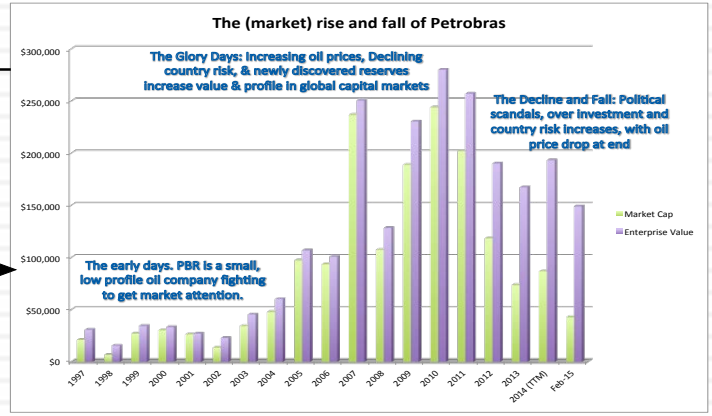
A Roadmap to destroying value: Petrobras (2015)

Step 1: Reinvest a lot, and reinvest badly..

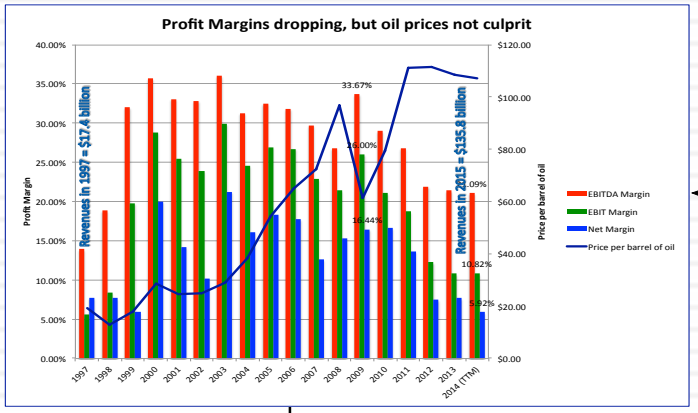


Rinse and Repeat

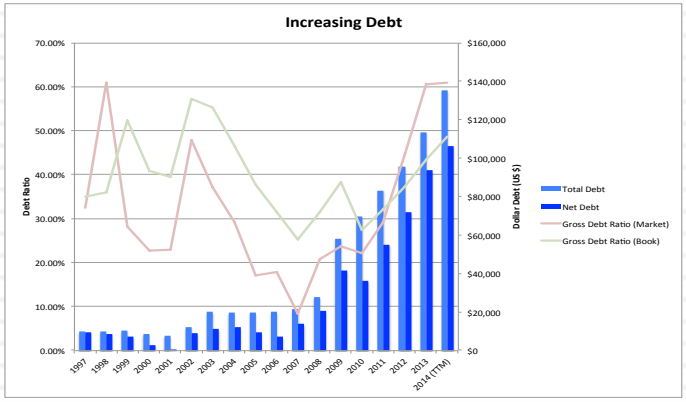
Step 5: Mission Accomplished



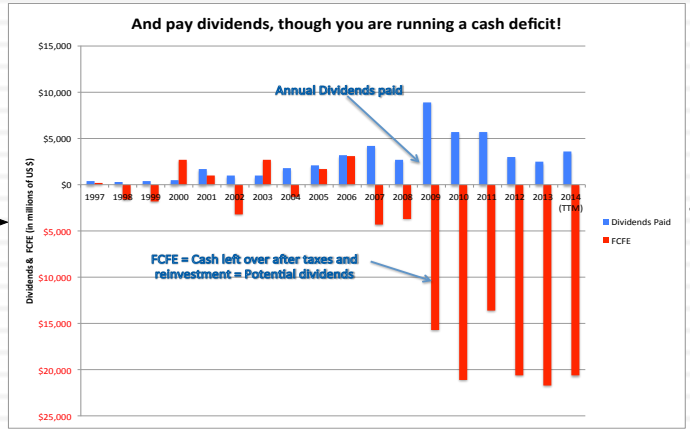
Step 2: Grow revenues, while letting profit margins slide



Step 4; Borrow money to cover the difference



Step 3: Pay dividends like a utility



Step 2: Create a narrative for the future

- 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.
  - Rule 1: Keep it simple.
  - Rule 2: Keep it focused.

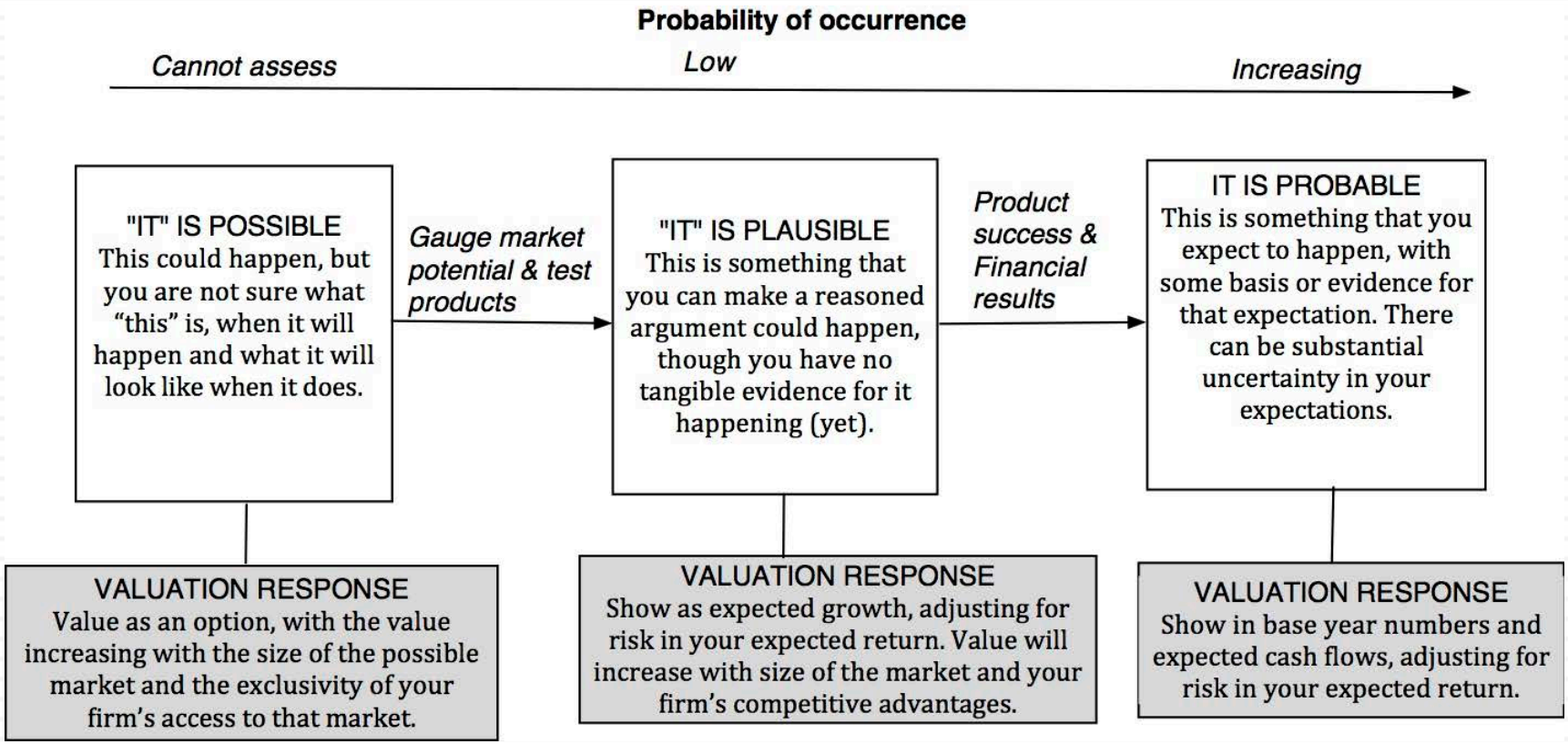
Four narratives: Apple, Twitter, Uber & Petrobras

1. **Apple (April 2013)**: Apple is a cash machine that derives much of its value from the smartphone business that is seeing growth slow and competition increase. Its size will make it difficult to create disruption that will create meaningful high growth.
2. **Twitter (October 2013)**: Twitter is an innovative social media company which will be successful in its quest in online advertising, but because of its structure (140 characters), it will not be a dominant player.
3. **Uber (June 2014)**: 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.
4. **Petrobras (March 2015):** Petrobras will find it difficult to break out of the self-destructive cycle it is In, partly because it has become a political pinata and partly because of its huge debt burden. However, the absence of new capital will focus less on growth and more on survival.

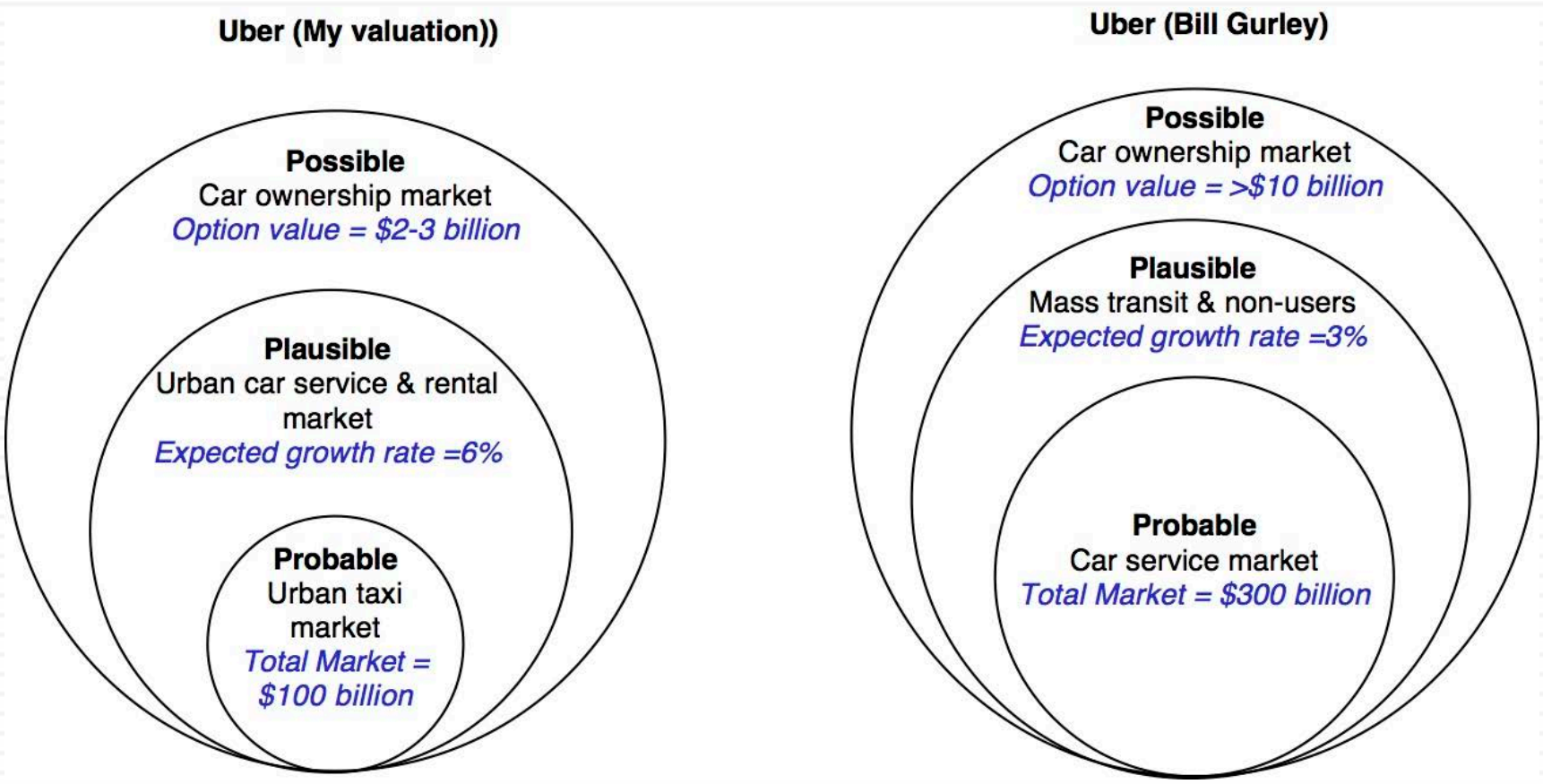
Be open to counter narratives: Bill Gurley's Uber narrative

- 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.
- Not just urban: Uber can create new demands for car service in parts of the country where taxis are not used (suburbia, small towns).
- Global networking benefits: By linking with technology and credit card companies, Uber can have global networking benefits.

Step 3: Check the narrative against history, economic first principles & common sense



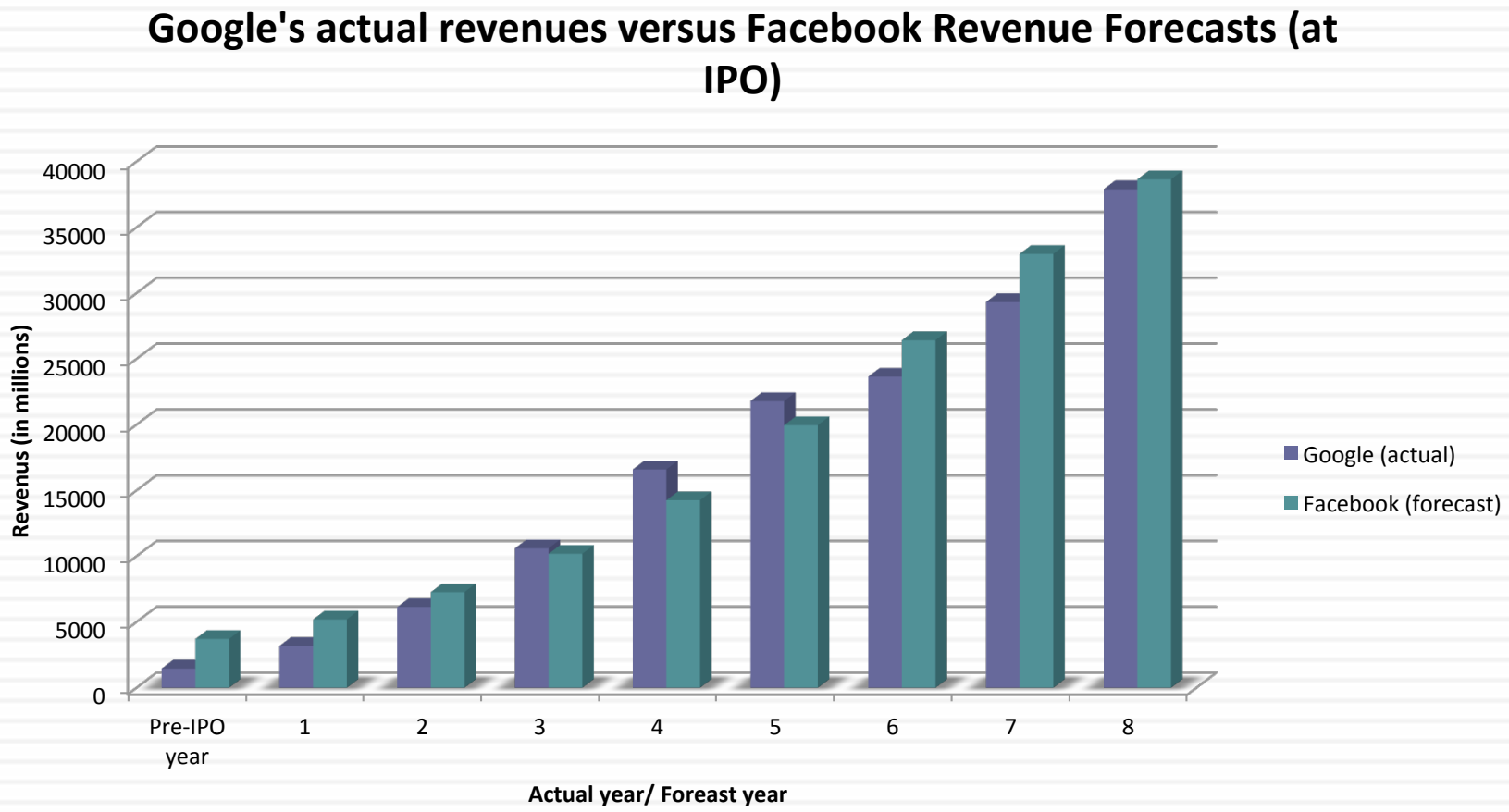
Uber: Possible, Plausible and Probable



1. Check the macro story – Backing out imputed revenues from market prices

Company	*Market Capitalization*	*Enterprise Value*	*Current Revenues*	*Breakeven Revenues (2023)*	*% from Online Ads (2012)*	*Imputed Online Ad Revenue (2023)*	*Cost of capital*	*Target margin*
Google	$291,586.00	$240,579.00	$56,594.00	$168,336.00	87.07%	$146,570.16	10%	22.49%
Facebook	$119,769.00	$111,684.00	$6,118.00	$90,959.00	84.08%	$76,478.33	10%	29.99%
Yahoo!	$34,688.00	$29,955.00	$4,823.00	$17,695.00	100%	$17,695.00	10%	25.00%
Linkedin	$27,044.00	$26,171.00	$1,244.00	$32,110.00	80.41%	$25,819.65	10%	25.00%
Twitter (Est)	$12,000.00	$11,000.00	$448.00	$7,846.00	90.00%	$7,061.40	10%	25.00%
Pandora	$4,833.00	$4,774.00	$528.00	$3,085.00	87.84%	$2,709.86	10%	25.00%
Yelp	$4,422.00	$4,325.00	$179.00	$2,825.00	94.31%	$2,664.26	10%	25.00%
Zillow	$3,192.00	$3,060.00	$152.00	$1,984.00	25.83%	$512.47	10%	25.00%
AOL	$2,586.00	$2,208.00	$2,211.00	$10,055.00	64.72%	$6,507.60	10%	9.32%
Retailmenot	$1,718.00	$1,644.00	$169.00	$1,605.00	100%	$1,605.00	10%	25.00%
OpenTable	$1,597.00	$1,505.00	$173.77	$1,361.38	74.22%	$1,010.42	10%	25.00%
US based	**$503,435.00**	**$436,905.00**	**$72,639.77**	**$337,861.38**	**$8.88**	**$288,634.13**		
Baidu	$53,589.00	$49,961.00	$4,182.00	$15,526.00	99.73%	$15,484.08	10%	25.00%
Sohu.com	$3,166.00	$2,540.00	$1,231.00	$1,338.00	36.33%	$486.10	10%	21.45%
Naver	$17,843.00	$17,595.00	$133.00	$11,227.00	62.94%	$7,066.27	10%	25.00%
Yandex	$12,654.00	$11,872.00	$1,065.00	$7,684.00	98%	$7,505.73	10%	25.00%
Global	**$590,687.00**	**$518,873.00**	**$79,250.77**	**$373,636.38**	**$11.85**	**$319,176.31**		

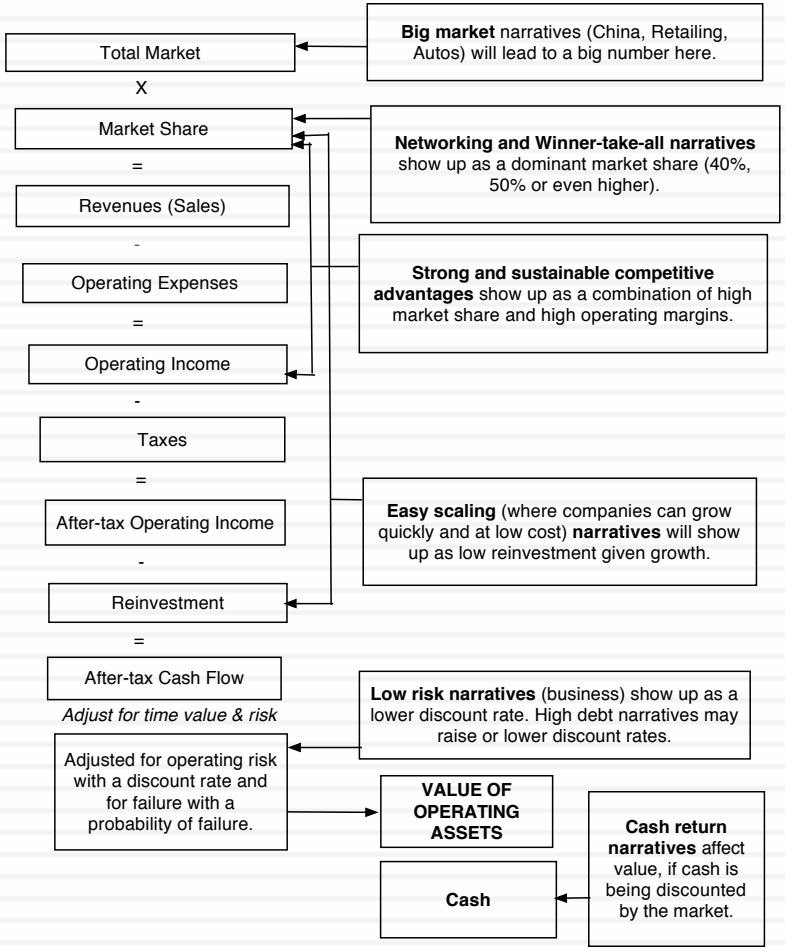
2. Measure up against the most successful companies in your “business”



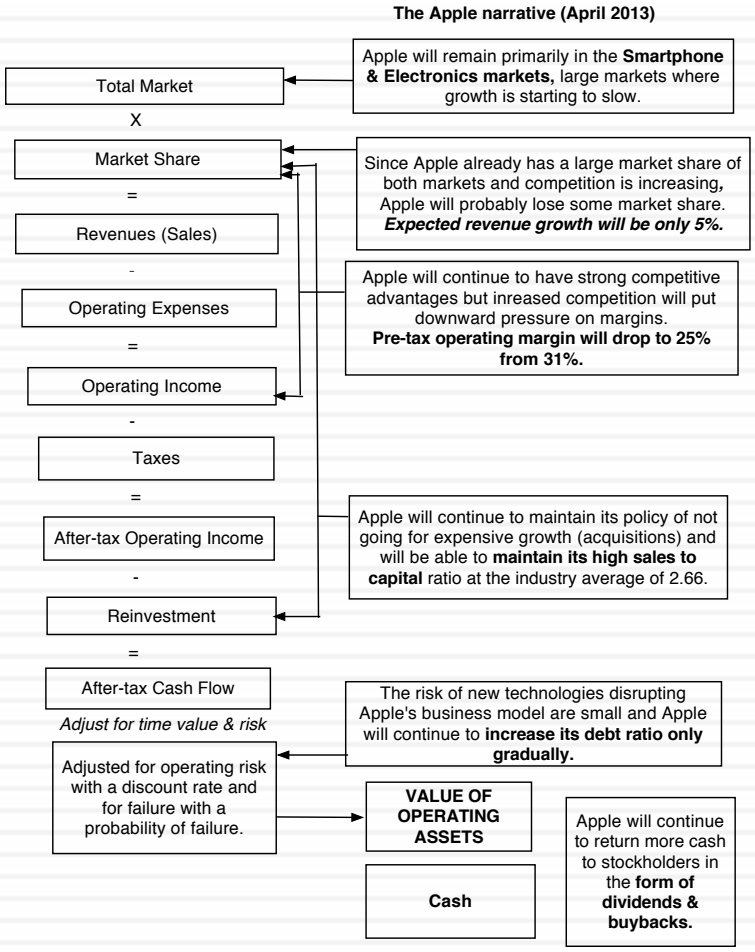
3. Identify the losers

- Apple: If Apple continues to dominate the smart phone business and generate high operating margins, the losers will be the other smart phone companies. (Do you buy that?)
- Twitter: If Twitter ends up with a market share of 20-25% of the online ad market, the losers will have to be Google and Facebook. (If you are also valuing those companies, are you showing dropping market shares for these companies?)
- Uber: If Uber succeeds as a urban car service company, that will be devastating for traditional taxi cab companies (Work through the consequences for taxi cab medallion prices). If it succeeds as a logistics company, that will be bad for automobile companies. (Do you think that you should sell them short?)
- Petrobras: Petrobras is the loser and so are its bankers, stockholders and Brazilian taxpayers. The question is whether there are any winners (who are not in jail).

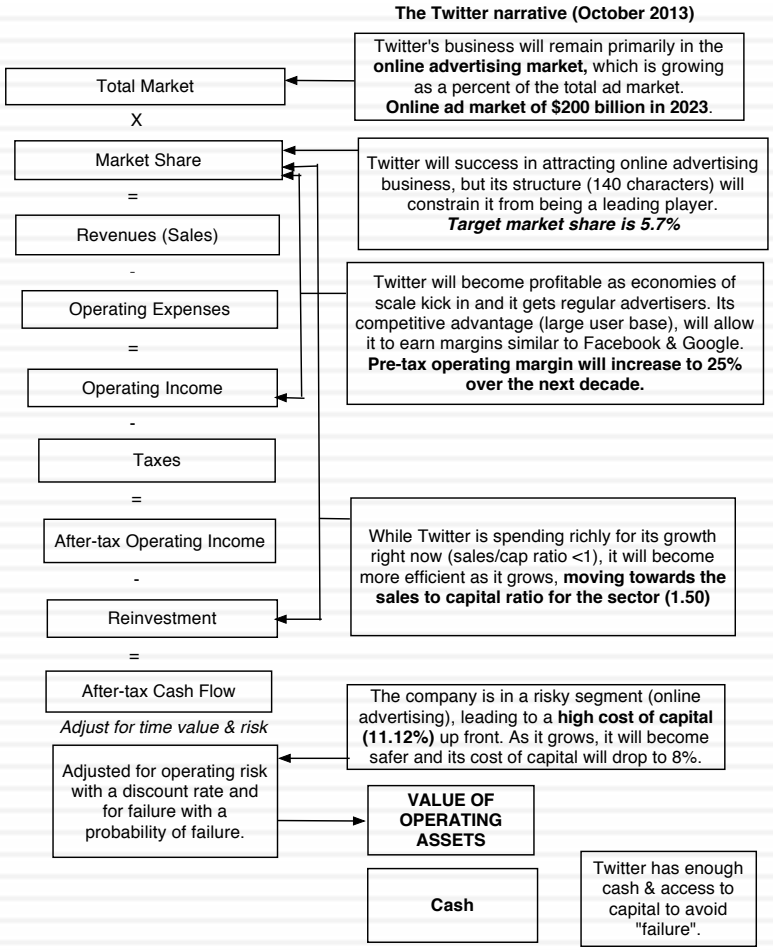
Step 4: Connect your narrative to key drivers of value



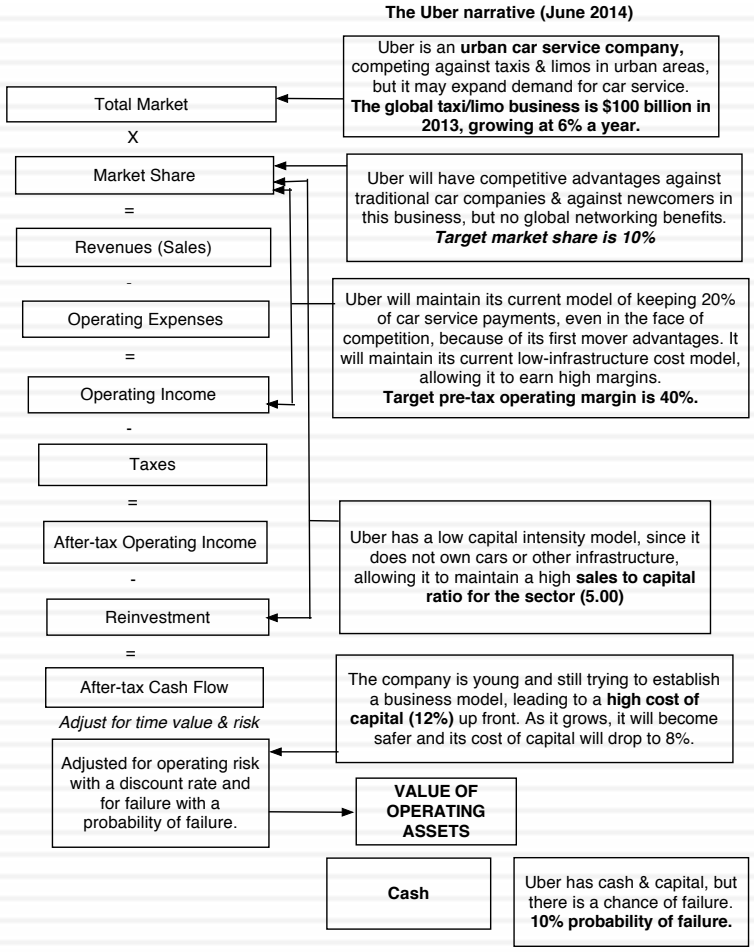
Apple (April 2013): From narrative to numbers



Twitter: From narrative to numbers



Uber: From narrative to numbers

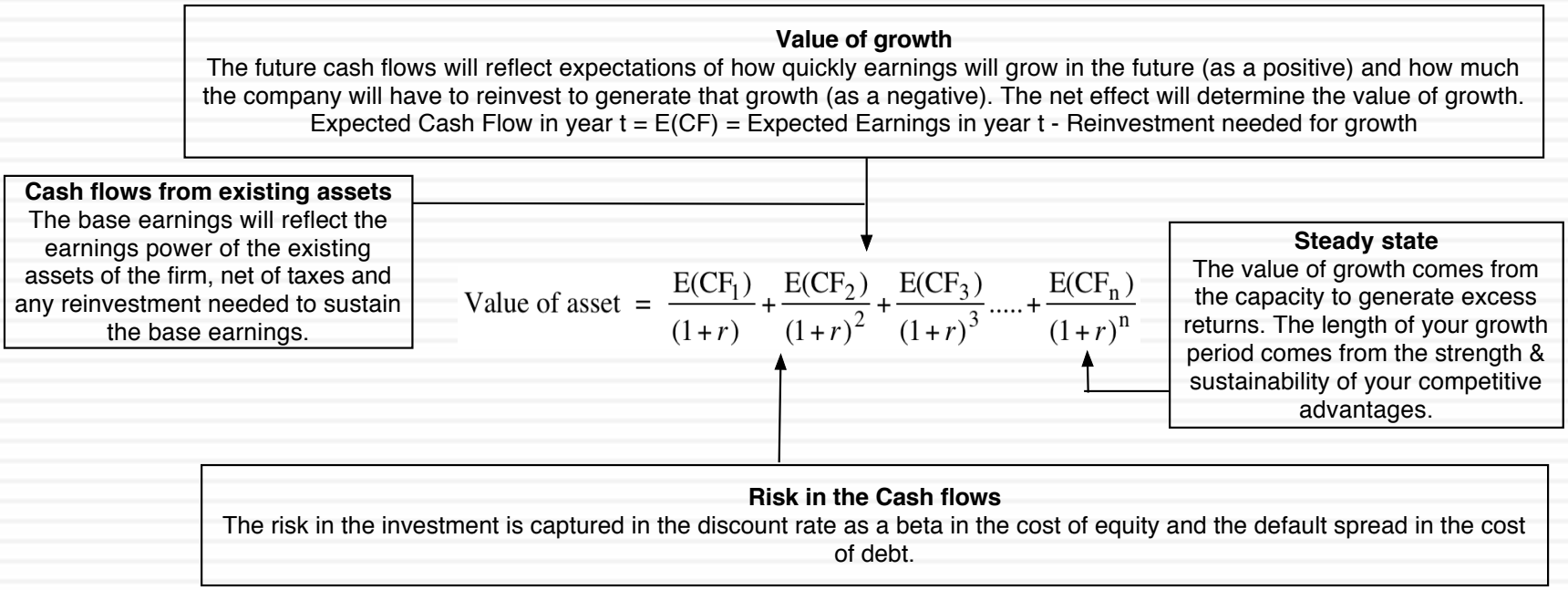


Petrobras: From narrative to numbers

Petrobras: When the narrative is depressing, the numbers will be too..

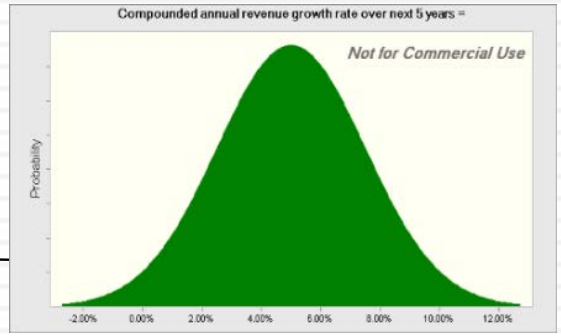
Assuming that the worse of the oil price drop is already reflected in current operating income and that the big write-offs this year are one time, the current operating income is assumed to the base year or normal income.	After-tax Operating Income = $14,697 (1-.217) = $11,507
Not anticipating a boost from oil prices going up, the operating income will grow at the growth rate of the global economy.	Expected growth rate in operating income forever = 2% (in US $)
Even that low growth rate will require reinvestment and Petrobras will continue to earn the low return on capital that it has generated for the last 5 years (6.45%)	Reinvestment rate = 2%/6.45% = 31.01%
Forced by its lenders to scale back its financial leverage, Petrobras will lower its current debt ratio of 75.94% to its average over the last 5 years of 43.58%	Cost of capital at 43.58% debt ratio = 11.17%

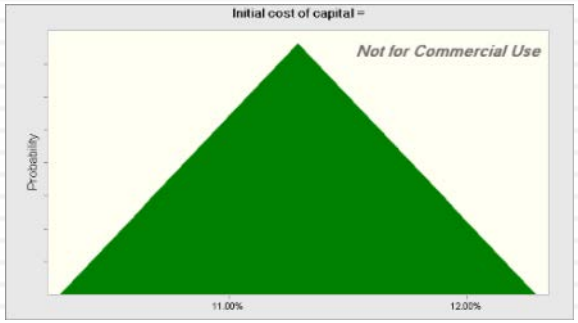
Step 5: Value the company



Correlations across assumptions make bad outcomes more likely to occur together, low revenue growth -> low margin -> high cost of capital

Correlation = 0.70

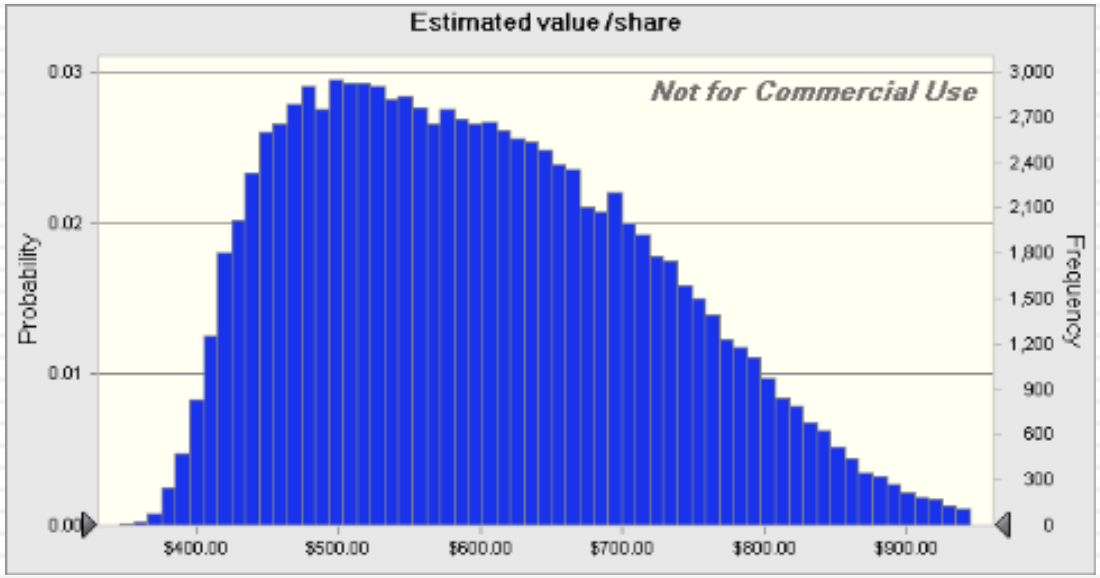




Pre-tax Operating Margin
Uniformly distributed, min=15%, max=35%

Revenue growth (next 5 years)
Normally distributed, with
avg=5%,sd=2.5%)

Cost of capital
Triangular distribution, min=10.29%, max =11.29%



Percentiles:	Forecast values
0%	$346.90
10%	$448.34
20%	$483.99
30%	$517.91
40%	$552.20
50%	$588.45
60%	$625.46
70%	$665.16
80%	$711.47
90%	$771.57
100%	$1,182.70

Statistics:	Forecast values
Trials	100,000
Base Case	$588.25
Mean	$600.74
Median	$588.45
Minimum	$346.90
Maximum	$1,182.70

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

x

Risk Premium
6.15%

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

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

D/E=1.71%

Uber: Valuation

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.

Petrobras: Valuation

Value of Petrobras Operating assets = 11,507 (1.02)(1-.3101)/(.1117-.02)	=	$88,332 million
+ Cash	=	$28,648 million
- Debt	=	$135,092
Value of Petrobras Equity	=	-$18,112
/ Number of share	/	13,044.50
Value per share	=	-$1.39/share

		Base Year Operating Income				
		Normalized for current oil price	*Operating Income in trailing 12 month*	*Current invested capital & average ROIC (5 years)*	*Average Operating Income over 5 years*	*Current Revenue, Operating margin in 2010*
Return on Capital on new investments	*Normalized for current oil price*	-$ 7.05	-$ 5.71	-$ 5.48	-$ 4.92	-$ 3.38
	Trailing 12-month	-$ 5.50	-$ 2.27	-$ 1.73	-$ 0.39	$ 3.32
	Average over last 5 years	-$ 5.10	-$ 1.39	-$ 0.76	$ 0.78	$ 5.04
	Equal to cost of capital	-$ 4.52	-$ 0.10	$ 0.64	$ 2.48	$ 7.55
	Average over last 10 years	-$ 4.39	$ 0.19	$ 0.96	$ 2.86	$ 8.11

Step 6: 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)

Narrative breaks, shifts & changes

"When my information changes, I alter my conclusions. What do you do, sir?"

Lord Keynes

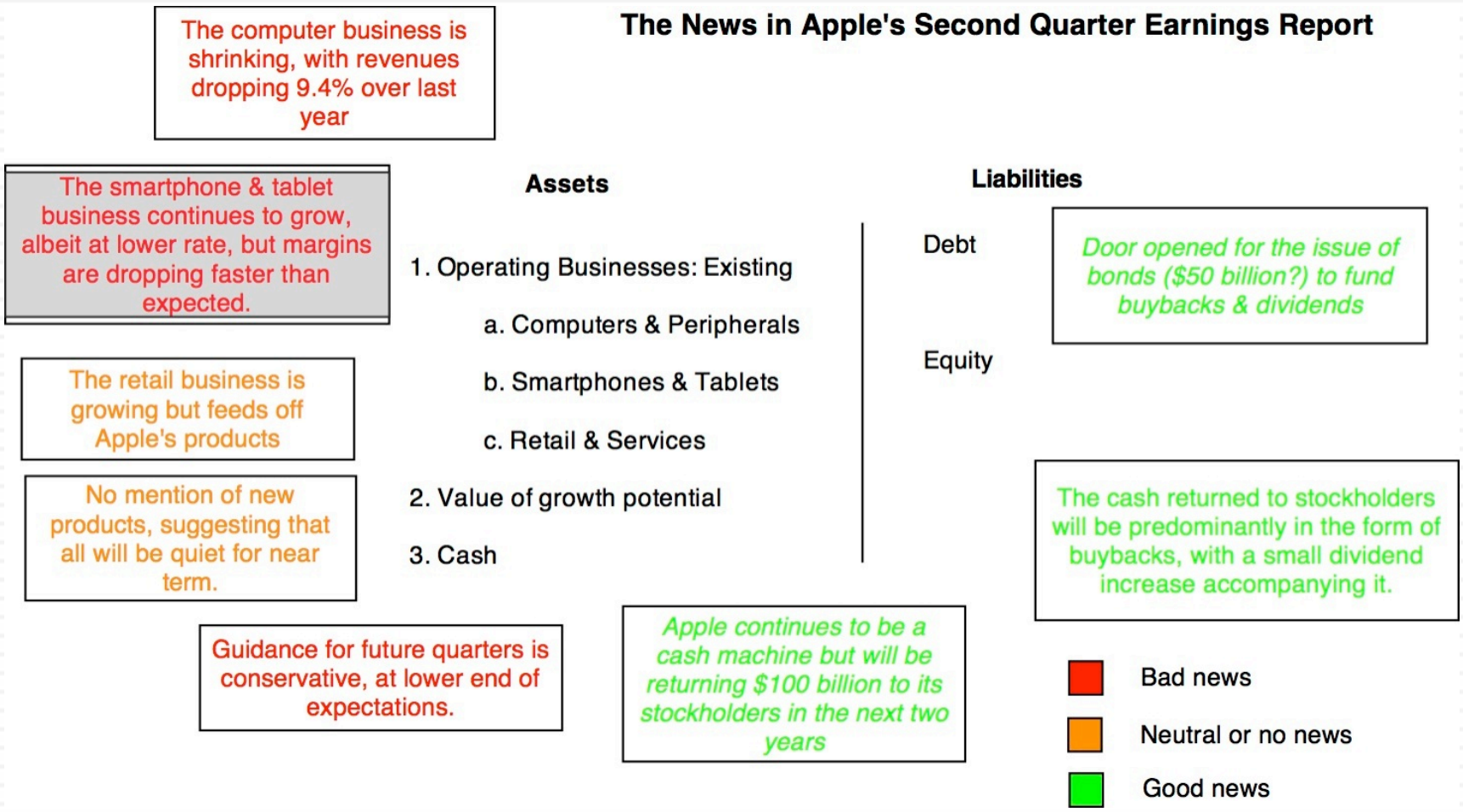
Why narratives change

1. Earnings reports: Every earnings announcement from a firm is a chance to reassess the narrative about the firm.
2. Corporate actions: Any action that changes the basic construct for the firm, including divestitures, acquisitions and splits offs.
3. Management change: A new CEO, board of directors or other significant management change.
4. Macroeconomic changes: A change in the macroeconomic environment, leading to shifts in interest rates, inflation, exchange rates or other variables.
5. Political changes: A change in government, political system or any structural shift.

How narratives change

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

An Earnings Report: Apple in May 2013



Apple: Another Earnings Report (September 2014)

In September 2014, Apple reported its third quarter earnings. While much of the information followed predictable patterns (Apple still gets the bulk of its revenues from smartphones, a market that is seeing slowing growth and smaller margins), Apple did announce two new products: the iWatch and Apple Pay.

1. Do you think either of these new products has the capacity to alter the current narrative for Apple?
2. If so, which one has the greater potential?
3. What are some of the indicators you will track to see if this potential is being captured?

Twitter: Searching for a change– Sept 2014 (and contrasting with Facebook)

Twitter's Numbers

Report Date	Business Breakdown		Global Breakdown		Mobile Breakdown		Invested Capital		
	Advertising	*Data Licensing*	*Domestic*	*Foreign*	*Mobile*	*Rest*	*Capital*	*Quarterly Sales/Capital*	*T12m Sales/ Capital*
2/5/14	90.53%	9.47%	72.80%	27.20%	75%	25%	$827	0.29	0.80
4/29/14	90.40%	9.60%	72.05%	27.95%	80%	20%	$863	0.29	0.93
7/29/14	88.78%	11.22%	67.31%	32.69%	81%	19%	$1,051	0.30	0.93

Facebook's Numbers

	# Users (in millions)			Revenue Statistics		Net Income		Invested Capital		
Report Date	*MAU*	*DAU*	*Mobile MAU*	*Advertising*	*Mobile*	*Before SBC*	*After SBC*	*Capital*	*Quarterly Sales/Capital*	*T12m Sales/ Capital*
7/26/12	955	552	543	83.78%	NR	-$157	$295	$3,515	0.34	1.23
10/23/12	1010	584	604	86.37%	NR	-$59	$311	$4,252	0.30	1.09
1/30/13	1060	618	680	83.91%	23.00%	$64	$426	$4,120	0.38	1.24
5/1/13	1100	665	751	85.73%	30.00%	$219	$312	$4,272	0.34	1.28
7/24/13	1150	699	819	88.25%	41.00%	-$152	$488	$3,948	0.46	1.55
10/30/13	1190	728	874	89.29%	49.00%	$425	$621	$4,007	0.50	1.71
1/29/14	1230	757	945	90.52%	53.00%	$523	$780	$4,258	0.61	1.85
4/23/14	1280	802	1010	90.73%	59.00%	$642	$885	$4,299	0.58	2.07
7/23/14	1320	829	1070	92.10%	62.00%	$791	$1,090	$4,543	0.64	2.20

Uber: Potential narrative breaks/shifts/ changes

- Narrative breaks
  - Regulatory shut downs: A regulatory shut down, especially if coordinated across a large region (an entire country or countries) could be catastrophic.
  - Legal jeopardy: A lawsuit with potentially huge liabilities, with Uber as a co-defendant, may put its survival at risk.
- Narrative shifts:
  - Regulatory cost burdens: Regulatory requirements on insurance and other costs will reduce margins and profitability.
  - Competitive changes: The entry of new competitors (the exit of old ones) will have negative (positive) consequences.
  - Global networking advantages: If success in one market is spilling over into other markets, it improves the odds of Uber having a high market share.
- Narrative changes
  - Success in new markets: If the Uber date car and mom car become ubiquitous in suburbia, it changes Uber's potential market (and value).
  - Changes in car ownership patterns: If dealers see a decline in a subset of car buyers (young & urban?), that would be good news (indirectly) for Uber.

Petrobras: Narrative Shift?

- For a narrative shift to occur at Petrobras, investors must believe that the management at Petrobras is independent of the Brazilian government. That will be difficult to do, as long as you have a government-appointed CEO, hand-picked board of directors, shares with different voting rights and a golden share for the government.
- Put differently, the only agent capable of changing the Petrobras narrative is the Brazilian government and the only action that will convey that things have changed is a 'radical' change in how the company is structured and governed.

Management: Narratives, Numbers and Actions

"Management is, above all, a practice where art, science, and craft meet"

The Management Perspective

- Have a story: If you are the management of a company, it behooves you to create a narrative for your company, both to guide investors in how they should view the company and you, in your decision making.
- The CEO's job? This is perhaps the most significant mission for the top manager of a company and it is what strategists like to call "strategic vision", the capacity to elevate yourself above the details of every day management and to see/convey that narrative.
- Life Cycle: The importance of doing this is clearly larger, when a company is young and investors are seeking guidance but it is still critical as companies mature.

1. Develop a compelling, coherent narrative

1. Think like an investor: The steps involved in investors deriving a narrative for a company are identical to those needed by management: you have to develop a narrative, grounded in reality.
2. Use evidence (information) for feedback: The difference is that as managers, you have more power to act to deliver on that narrative and to potentially make it more expansive.
3. And your influence over outcomes: You also have access to more information, some of which may lead you to narrow your narrative and others to alter it.

2. Sell it to investors/employees/ customers

1. Communication skills: You have to be able to sell the narrative to investors, with just the right mix of numbers and story telling. You also have to get employees in your company to buy into your narrative and customers to go along.
2. Past experience: You will have more credibility, if you have converted narrative to numbers before, in other companies.
3. Charisma: Like anyone selling a big story, it helps to have a big personality and the charisma to get people to believe in your narrative (and in your capacity to convert the narrative to numbers).

3. Act consistently with your narrative

- If you have sold the world on your narrative, you should act consistently with that narrative in terms of
  - Where, how much and when you invest the company's resources.
  - The trade offs you make in decisions
  - The measures that you use to evaluate yourself and your progress on the narrative.
- If you act in ways that are inconsistent with your own narrative, you will lose long term (even if you may gain short term). Not only will you lose credibility with your investors, but your employees will take their cues from you about what matters and what does not.

4. Try to deliver numbers that back up narrative and be accountable when you do not..

1. Link numbers to narrative: When you report numbers to your investors, it is important that you tie those numbers (and how they are changing) with your narrative.
2. If numbers confirm narrative, restate the narrative: If the numbers are advancing your narrative, you should not only take credit for them but use it as your chance to restate your narrative.
3. Don't hide from bad numbers: If the numbers are contrary to narrative, face up to them and either explain why your narrative has not changed (in spite of the numbers) or has changed (because of the numbers)

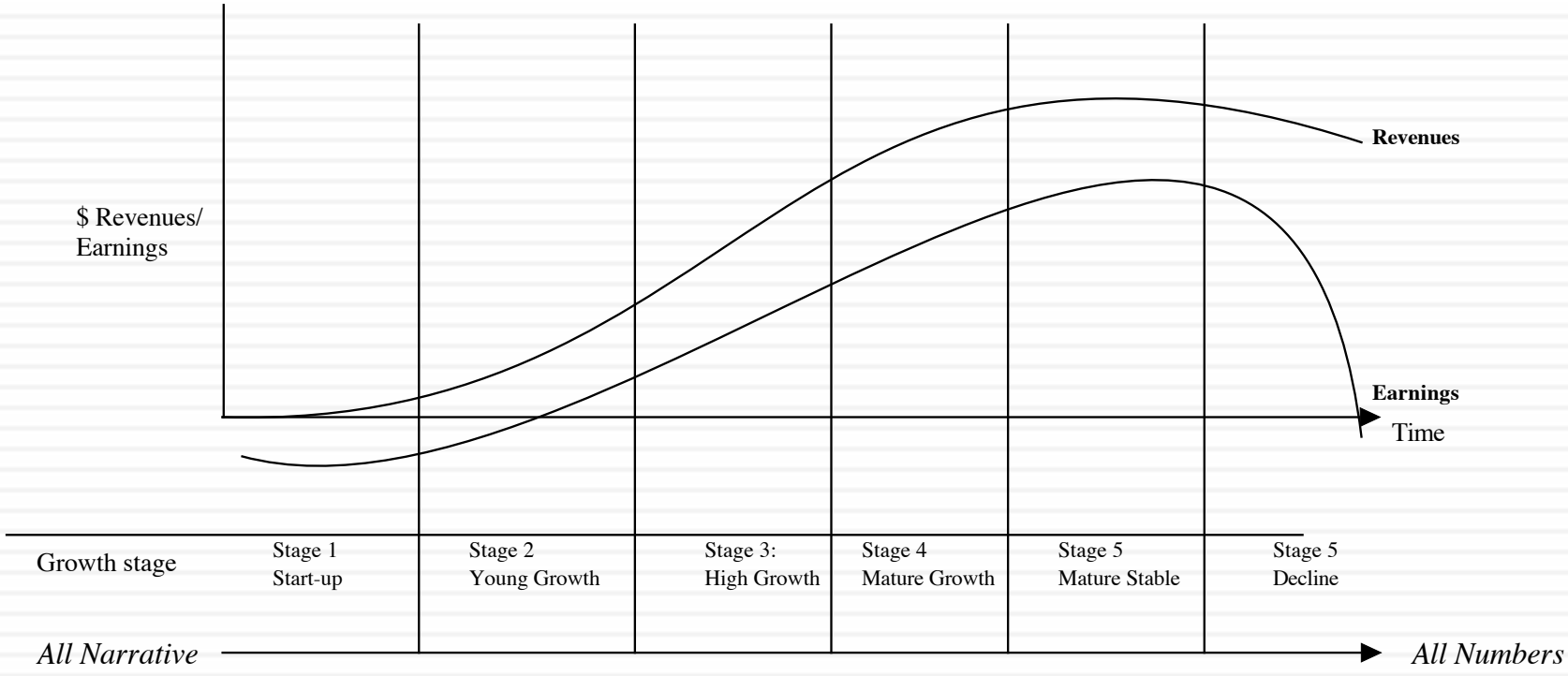
5. Don't get distracted

- By investors: Investors invest in companies for all types of reasons (and not just because of narratives). They have their own motives and agendas, some have more information than others and their advice can range the spectrum. Listen (respectfully) but you make your own decisions.
- By analysts: Analysts are free about dishing out advice and much of it reflects their view of the company, its competitors and the world. As with investors, analyst advice can range from abysmal to very good.
- By competitors: It is the job of your competitors to undercut your narrative and they will work at it. If you are reactive (to their actions) and, in the process, lose sight of your narrative, they have won.

A Company's Life Cycle: Narrative & Numbers

"Growing old is mandatory; growing up is optional."

A Company's Life Cycle & Narrative/ Numbers



As companies age, the emphasis shifts..

- Early in a company's life, when all you have are ideas and no clear business plan, it is all about the narrative. Not surprisingly, the most successful managers/investors at this stage are people who are stronger on narrative.
- As companies age, the emphasis shifts to numbers, partly because more of the value is determined by the narrative that has actually unfolded and partly because there are more numbers to focus on. The most successful managers/investors become people who are stronger on numbers.

As emphasis shifts, managers and investors can resist, adapt or move on

- As young start-ups succeed and start moving into the growth, the managers who were instrumental in their success have three choices:
  - Adapt and adjust their focus to include numbers, without giving up their narrative.
  - Stay completely focused on narrative and ignore numbers.
  - Hand over control of the operating details of the company to a numbers person while handling the narrative part.
- With investors, the transition is made easier by the existence of public markets. As companies go public, these investors can cash out and go back to their preferred habitat. Investors who stray far from their strengths will pay a price.

And the focus changes..

	The Idea	*The Product/Service*	*The Business Model*	*The Harvest*	*The End Game*
Phase	See an exploitable market	Develop a product or service to exploit the market	Create a business model to generate profits on product or service	Run as an ongoing business	Manage decline
Focus is on	Market Potential, Survival	Product usage, Competition	Viability and Scalability of Business Model	Profitability & Sustainability	Asset liquidity, Cash flows & Survival
Pricing Measures	Market size, Cash on hand, Access to capital	Number of users, User intensity	User engagement with business model, Revenues	Earnings (Levels, Margins & Returns)	Cash flows, Book Value
Pricing Metrics	EV/ Market Potential	EV/User	EV/Sales	PE & EV/ EBITDA	Dividend Yields, Price to Book

The End

"There is no real ending. It's just the place where you stop the story."