



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 business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

A 'narrative' about Amazon: A "Field of Dreams" Company

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 services 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

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 than the average retailer. Reinvest \$1 for every \$3.68 in additional revenues

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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 business 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 or Right Brain?

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

LEFT SIDE



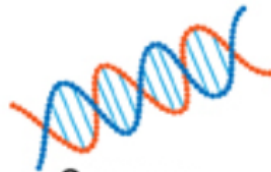
Linear

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



Reality-based

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



Sequence

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

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

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.



Fantasy-oriented

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



Random

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



Concrete

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

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.

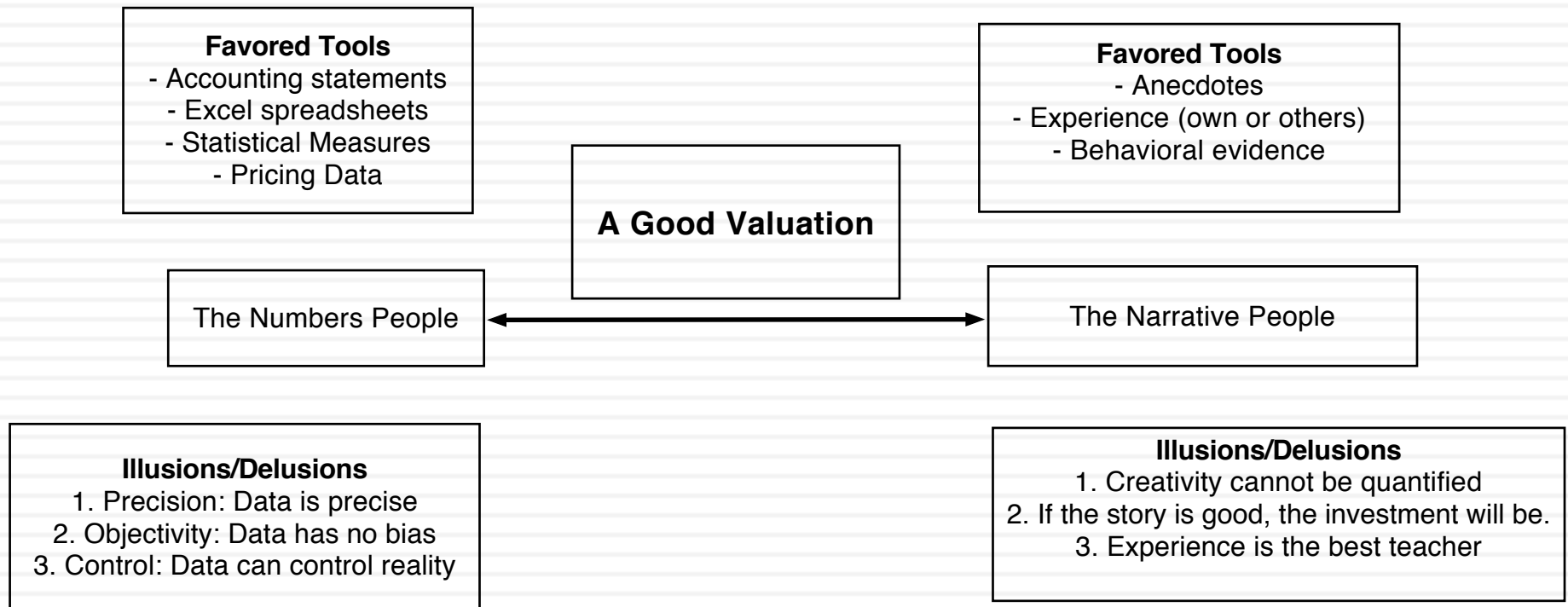
The delusions of the number crunchers

- 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.

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.

Bridging the Gap

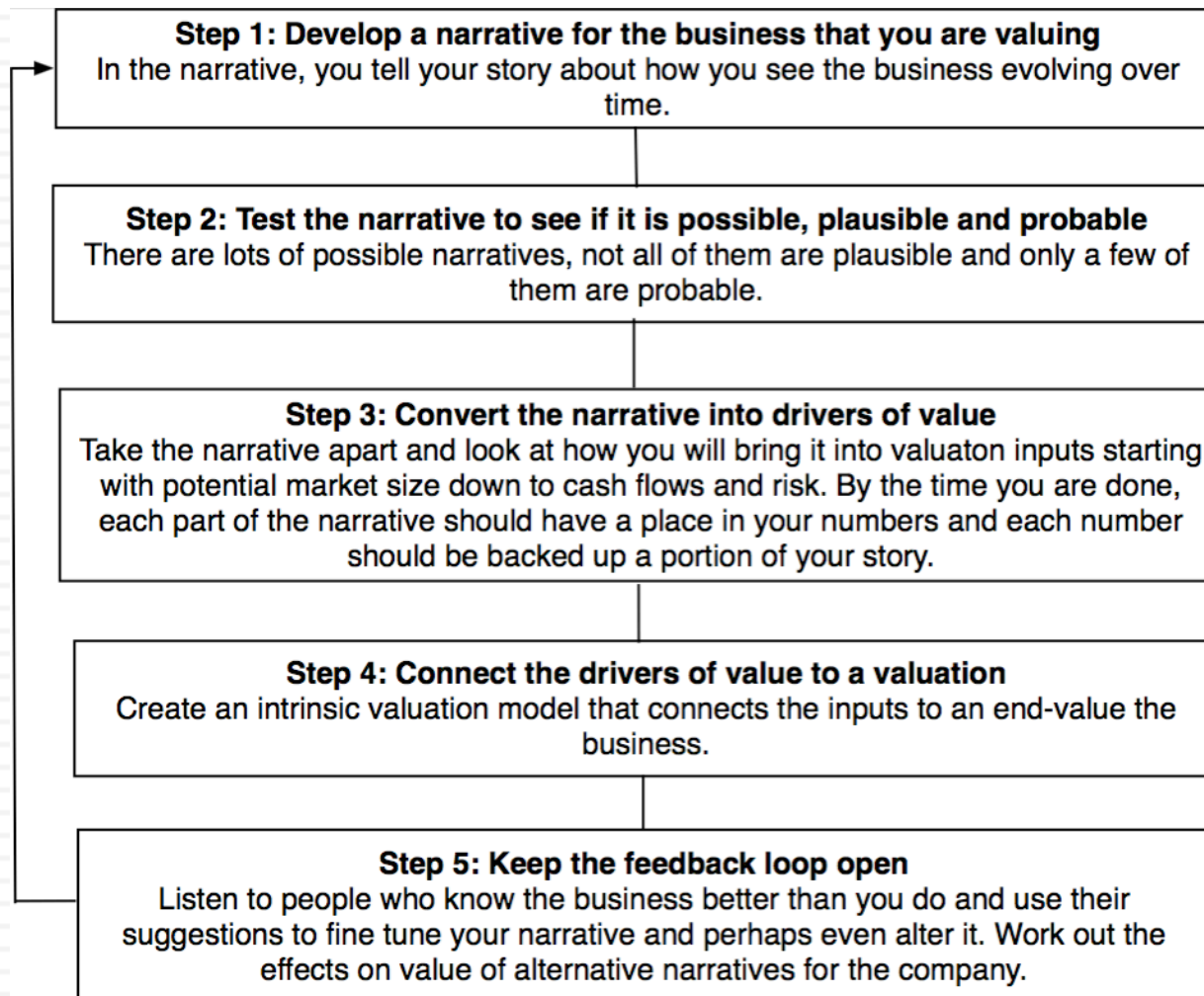




FROM NARRATIVE TO NUMBERS:
THE MECHANICS

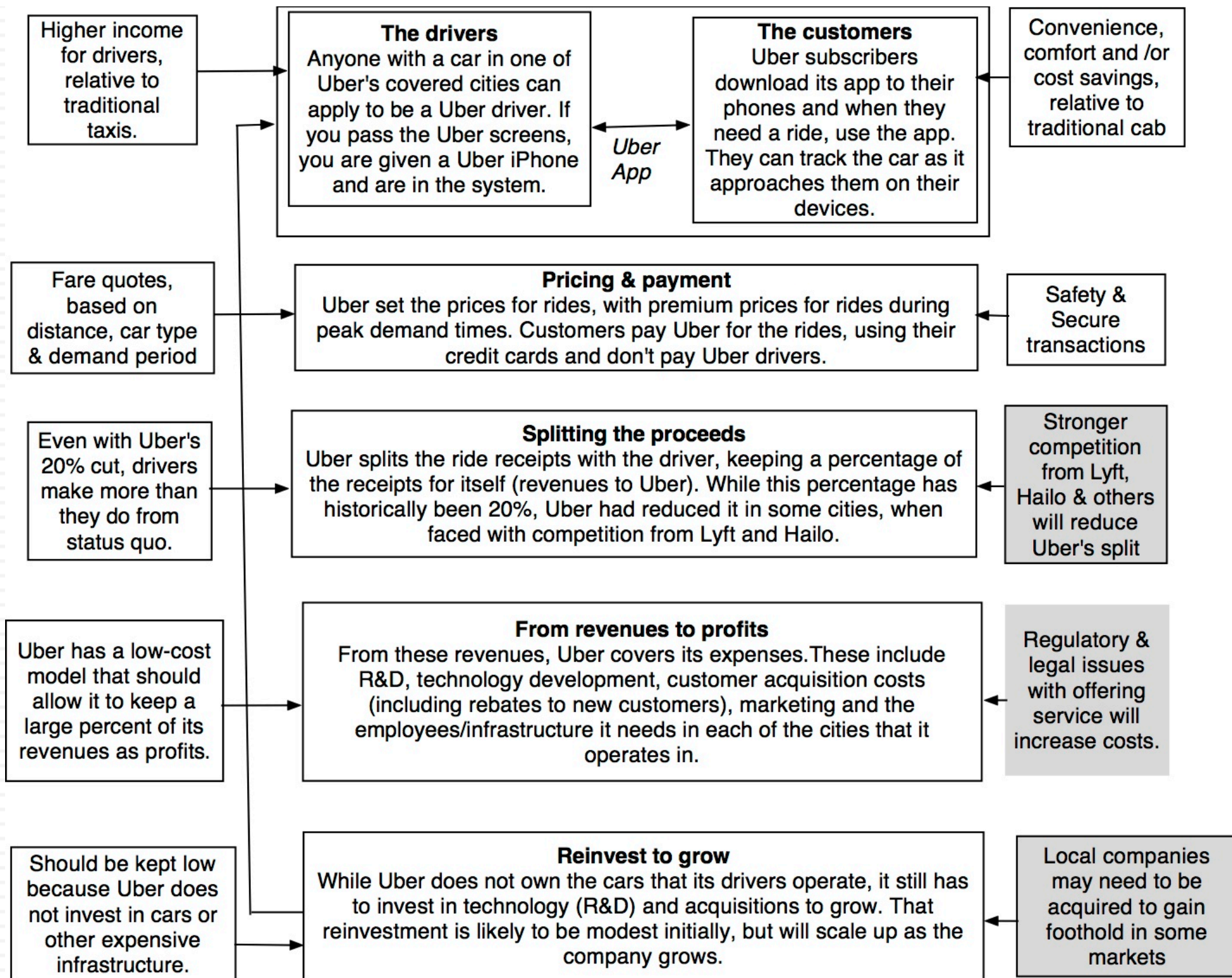


The Steps



Step 1: Survey the landscape

- 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 and its history).
 - ▣ The market or markets that you see it growing in.
 - ▣ The competition it faces and will face.
 - ▣ The macro environment in which it operates.



Low Growth

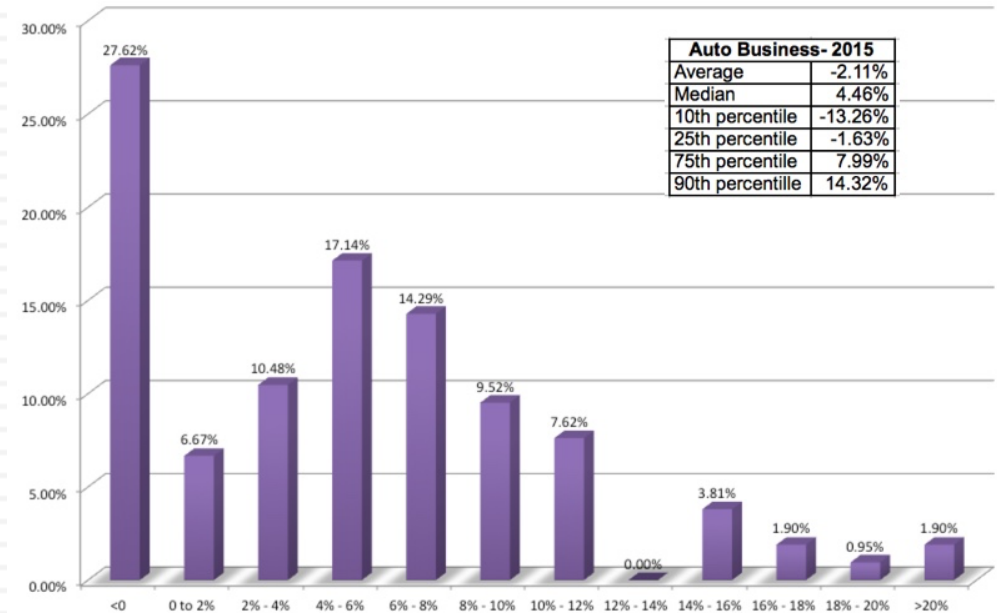
The Auto Business

Low Margins

Year	Revenues (\$)	% Growth Rate
2005	1,274,716.60	
2006	1,421,804.20	11.54%
2007	1,854,576.40	30.44%
2008	1,818,533.00	-1.94%
2009	1,572,890.10	-13.51%
2010	1,816,269.40	15.47%
2011	1,962,630.40	8.06%
2012	2,110,572.20	7.54%
2013	2,158,603.00	2.28%
2014	2,086,124.80	-3.36%
ounded Average =		5.63%

+

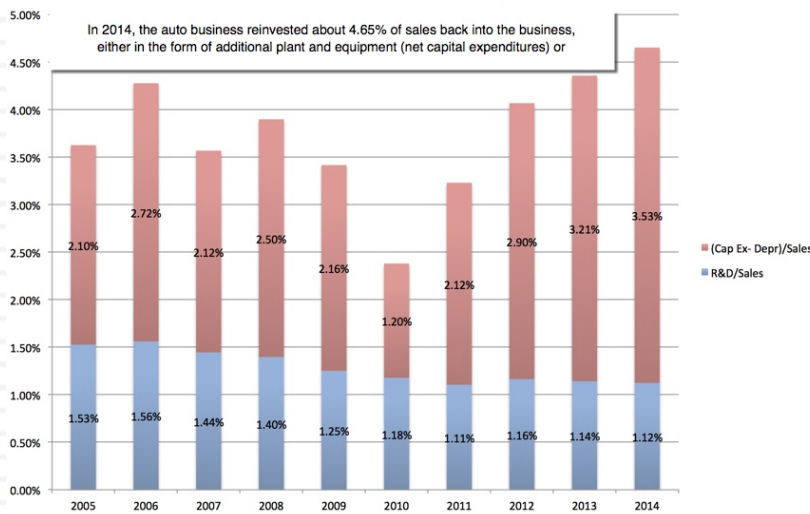
The Automobile Business: Pre-tax Operating Margins in 2015



High & Increasing Reinvestment

Bad Business

The Reinvestment Burden: Investment as % of Sales for Auto Business



=

	ROIC	Cost of capital	ROIC - Cost of capital
2004	6.82%	7.93%	-1.11%
2005	10.47%	7.02%	3.45%
2006	4.60%	7.97%	-3.37%
2007	7.62%	8.50%	-0.88%
2008	3.48%	8.03%	-4.55%
2009	-4.97%	8.58%	-13.55%
2010	5.16%	8.03%	-2.87%
2011	7.55%	8.15%	-0.60%
2012	7.80%	8.55%	-0.75%
2013	7.83%	8.47%	-0.64%
2014	6.47%	7.53%	-1.06%

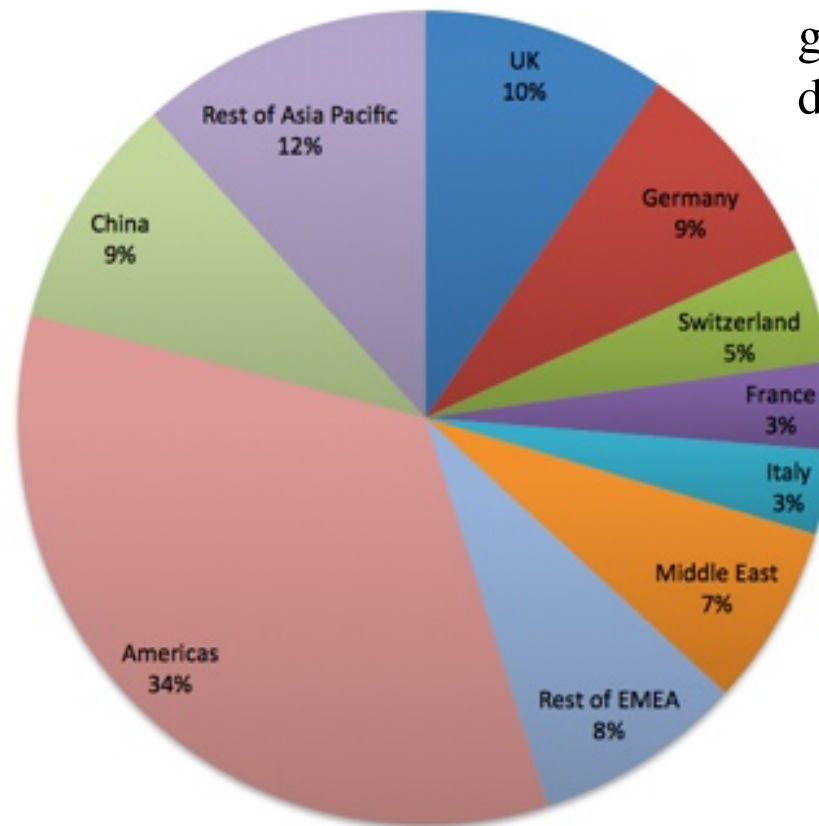
Only once in the last 10 years have auto companies collectively earned more than their cost of capital

What makes Ferrari different?

Ferrari sold only 7,255 cars in all of 2014

Ferrari had a profit margin of 18.2%, in the 95th percentile, partly because of its high prices and partly because it spends little on advertising.

Ferrari: Geographical Sales (2014)

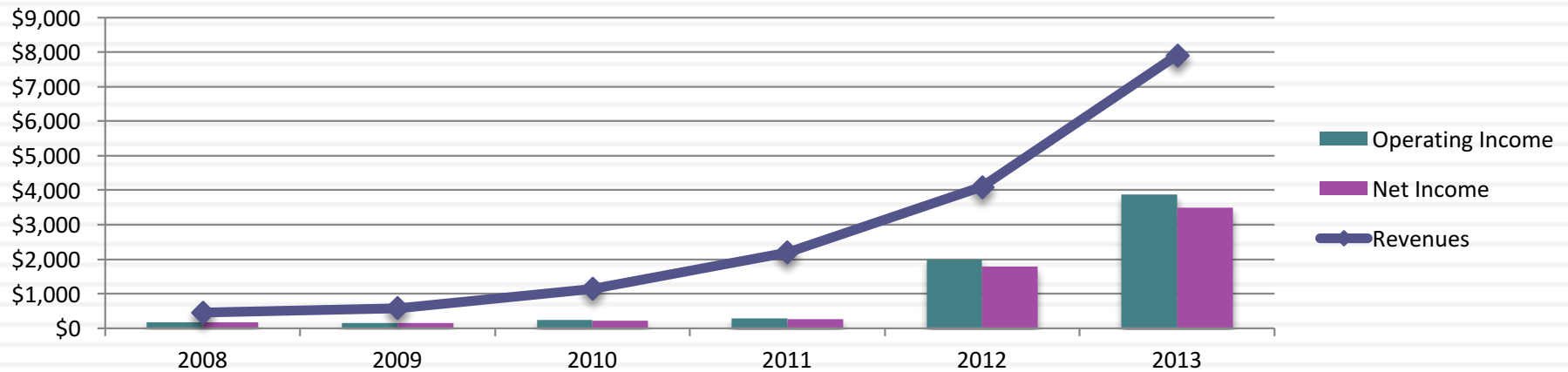


Ferrari sales (in units) have grown very little in the last decade & have been stable

Ferrari has not invested in new plants.

Alibaba: The Rocket takes off..

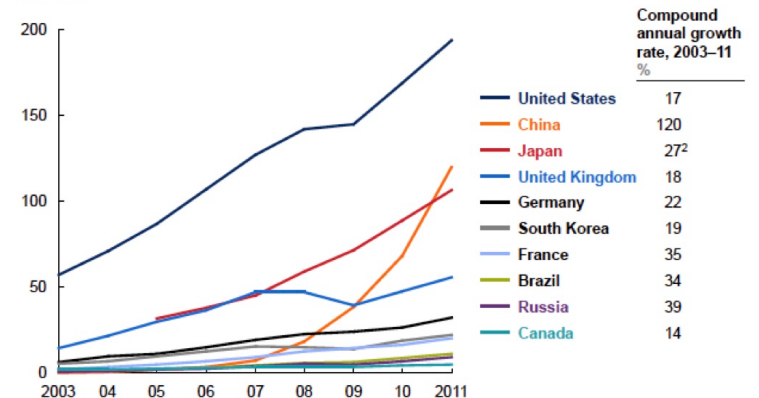
Figure 6.5: Alibaba- The rocket takes off!



Market Domination

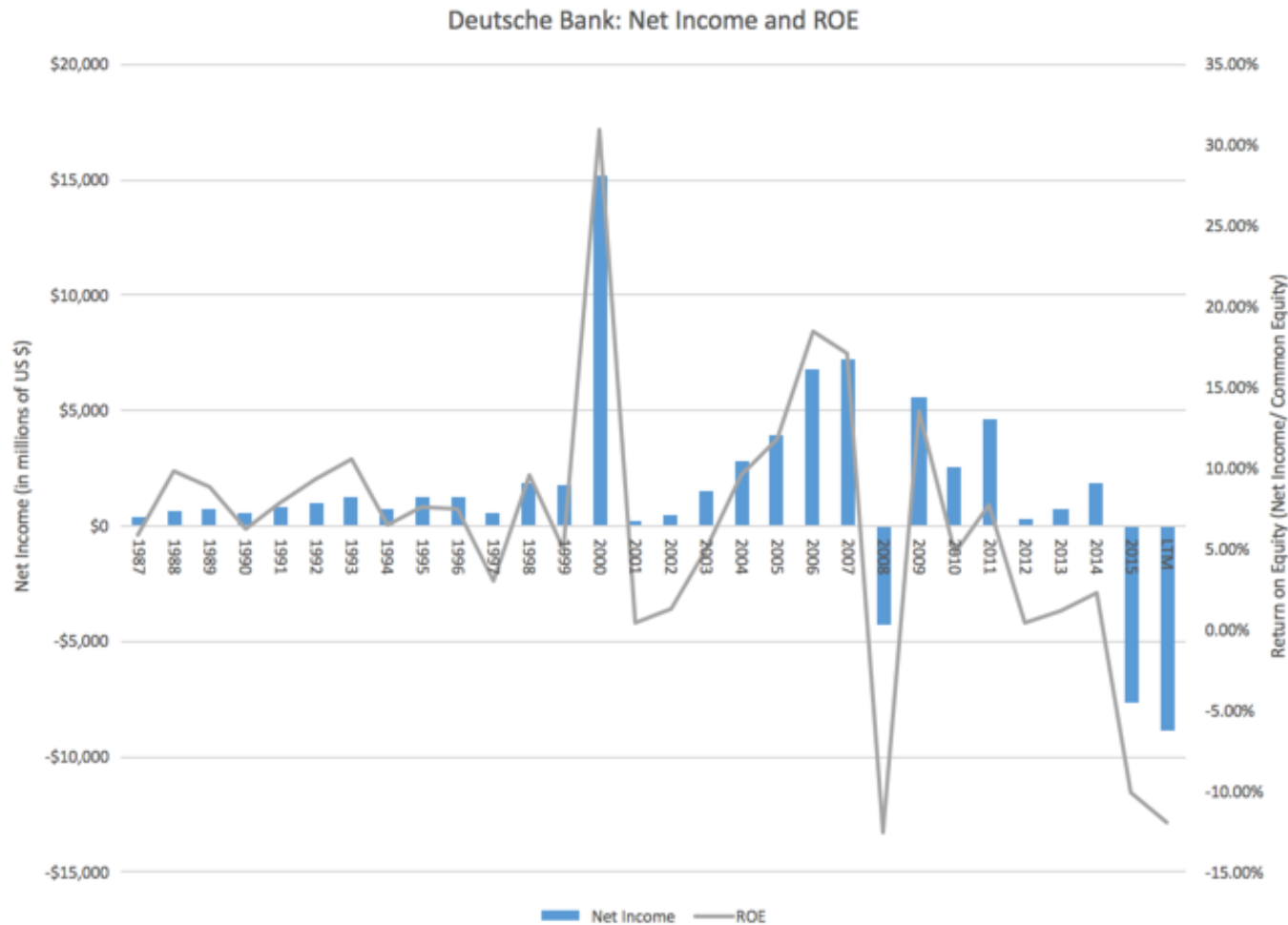
	B2C	C2C	Mobile	Online Payment			
Tmall	49.08%	TaoBao	92.59%	TaoBao	81.45%	Alipay	49%
JingDong	18.16%	Paipai	5.56%	JingDong	6.67%	Tenpay	20%
Tencent B2C	5.68%	Eachnet	1.85%	Maimaibao	1.11%	Unionpay	10%
Suning	4.30%			Suning	1.01%	Others	21%
Amazon China	2.72%			Amazon	0.84%		
Dangdang	2.12%			Others	8.92%		
Others	17.94%						

China's e-tailing market has posted the world's highest growth rate
2003-11 e-tailing market¹
\$ billion

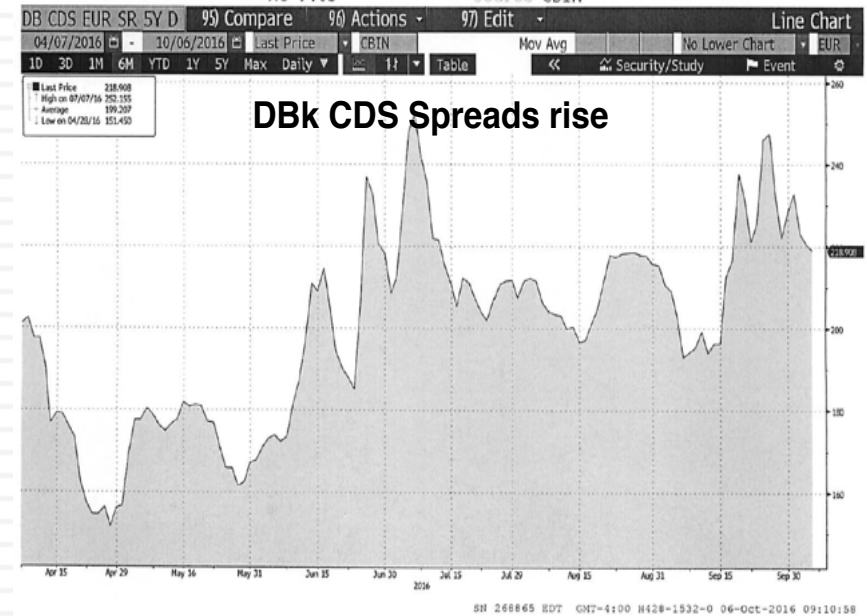
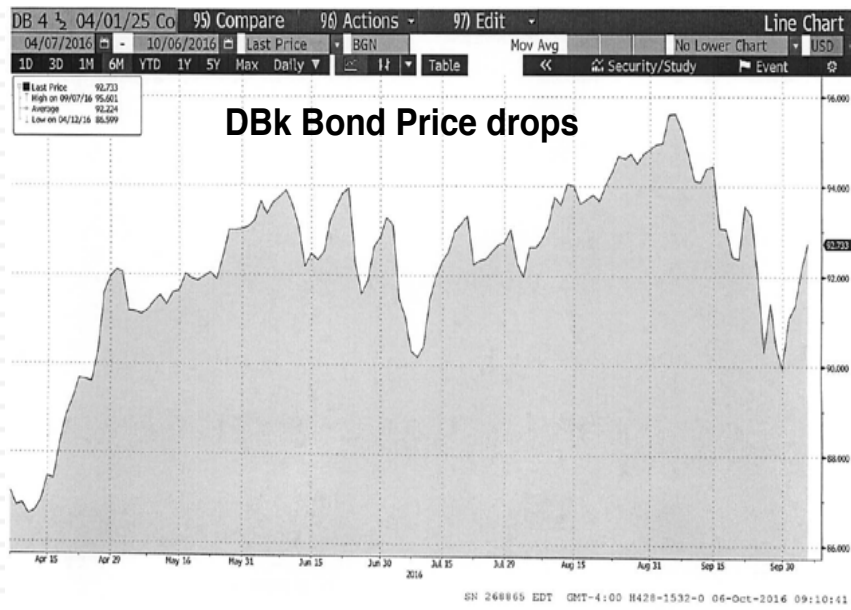


In the fastest growing market in the world 19

In October 2015: Deutsche Bank's not so good, very bad, horrible decade

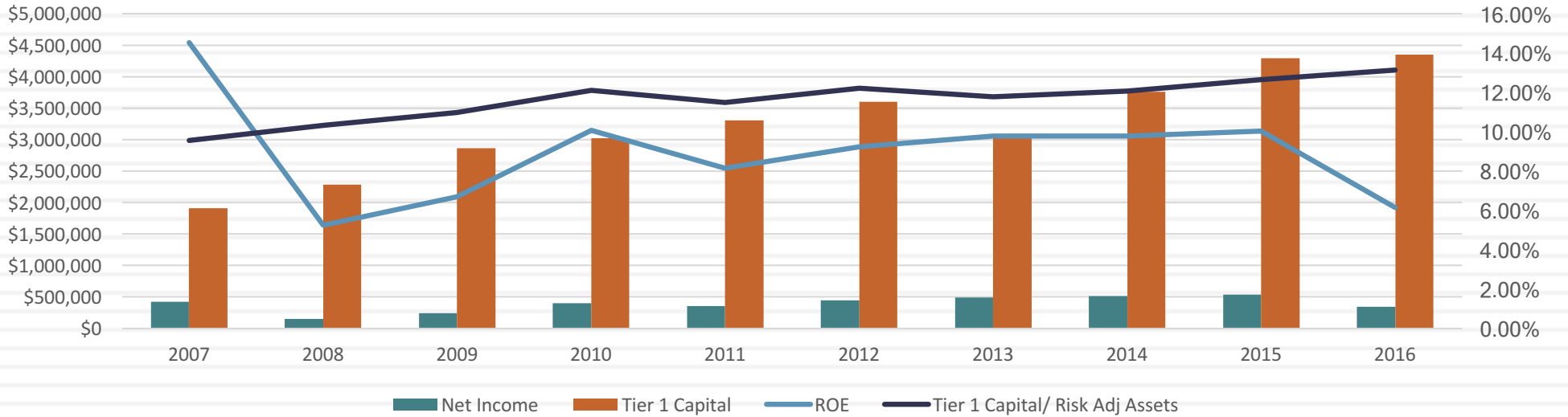


The Market's Crisis Reaction

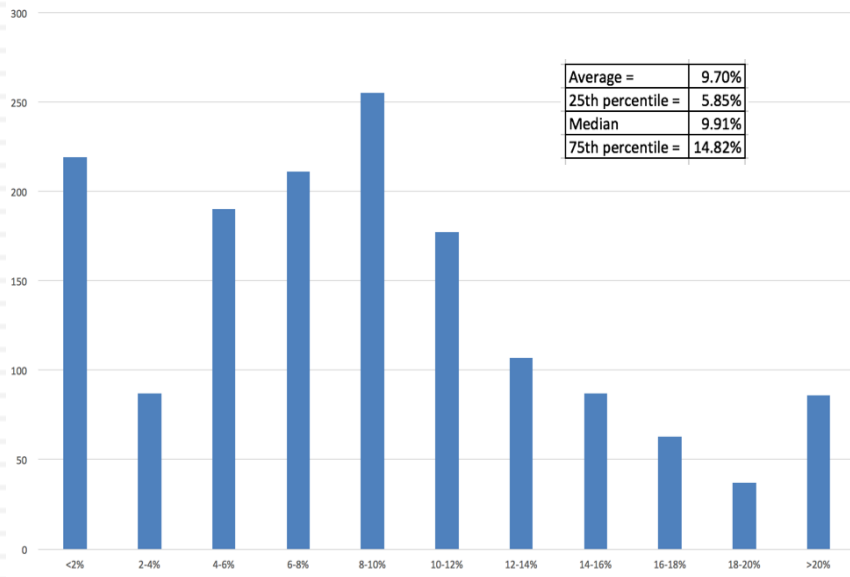


The Banking Business

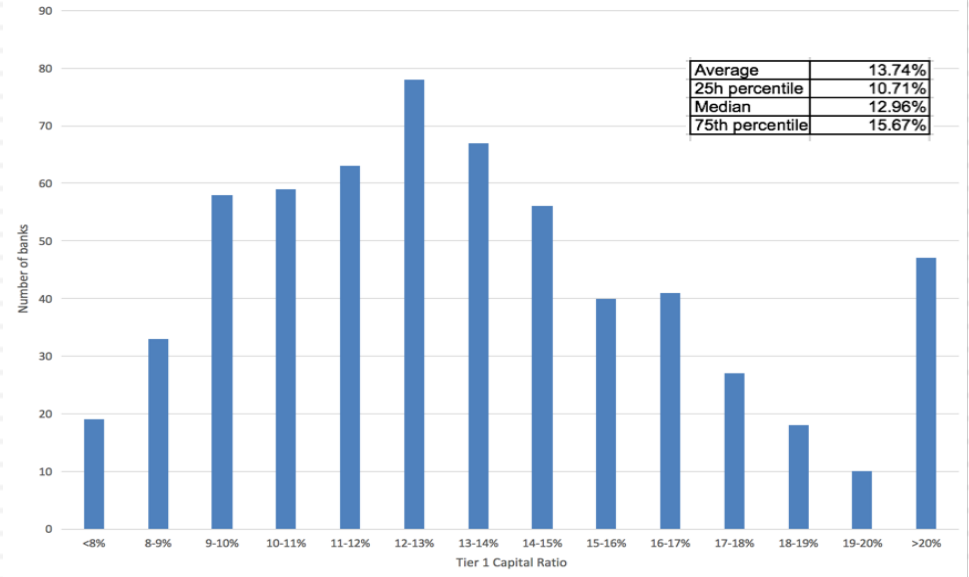
The Banking Business: 2007 to 2016



Return on Equity (ROE): Global Banks in October 2016



Tier 1 Capital Ratios - Global Banks at the end of 2015



Step 2: Create a narrative for the future

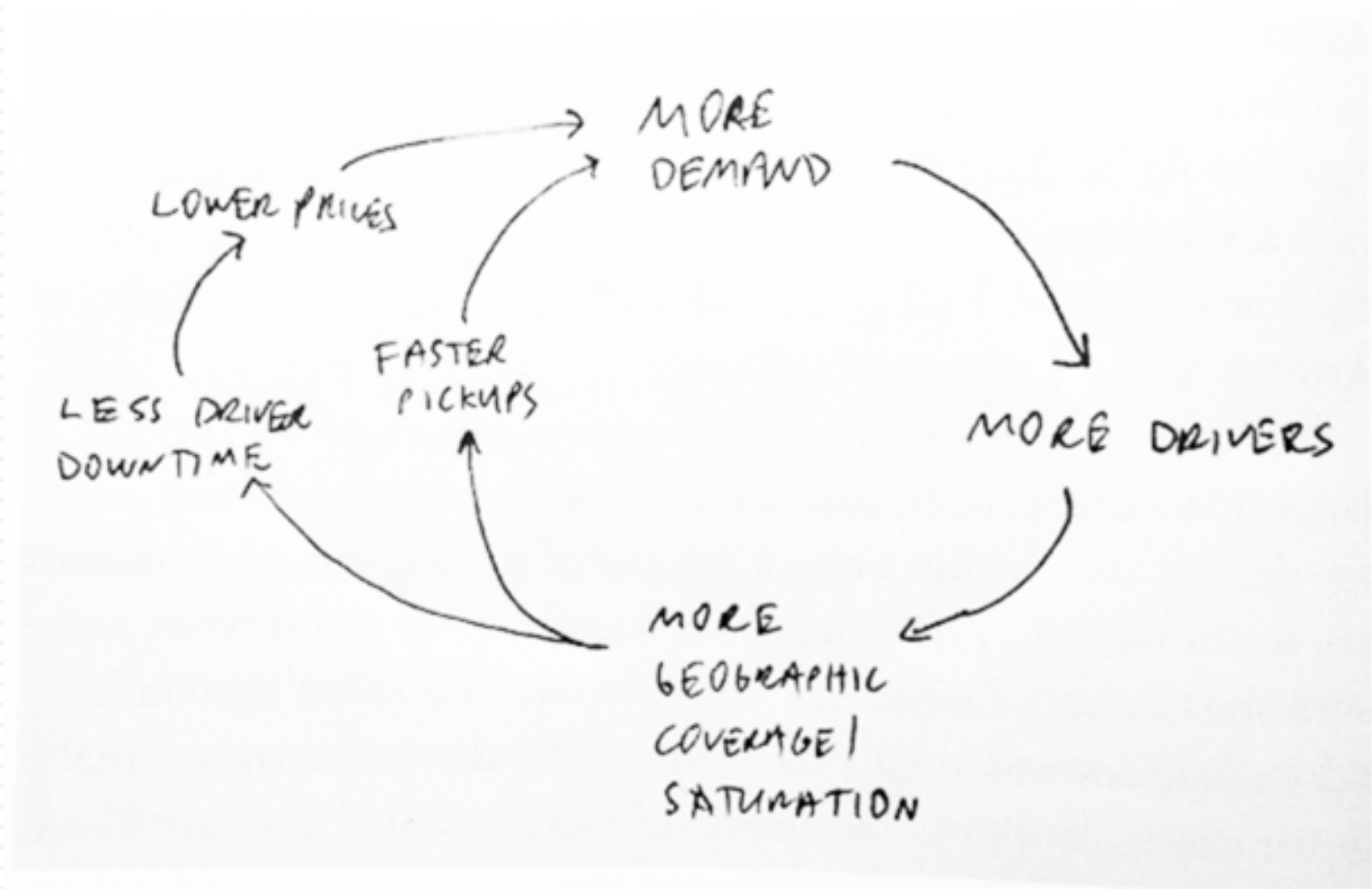
- Every valuation starts with a narrative, a story that you see unfolding for your company in the future.
- In developing this narrative, you will be making assessments of your company (its products, its management), the market or markets that you see it growing in, the competition it faces and will face and the macro environment in which it operates.
 - ▣ Rule 1: Keep it simple.
 - ▣ Rule 2: Keep it focused.

The Uber Narrative

In June 2014, my initial narrative for Uber was that it would be

1. An urban car service business: I saw Uber primarily as a force in urban areas and only in the car service business.
2. Which would expand the business moderately (about 40% over ten years) by bringing in new users.
3. With local networking benefits: If Uber becomes large enough in any city, it will quickly become larger, but that will be of little help when it enters a new city.
4. Maintain its revenue sharing (20%) system due to strong competitive advantages (from being a first mover).
5. And its existing low-capital business model, with drivers as contractors and very little investment in infrastructure.

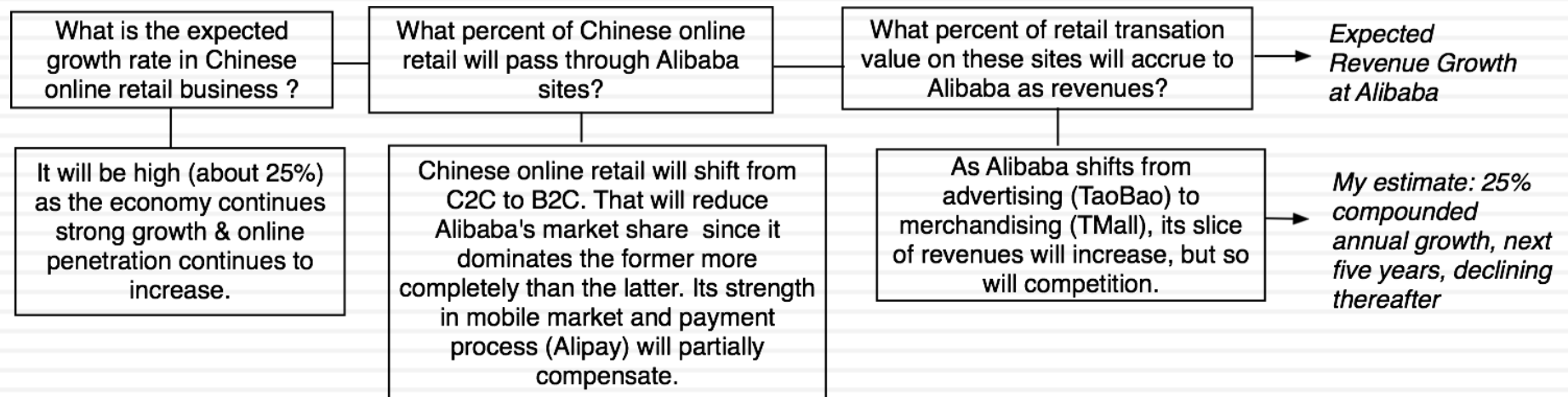
Uber's Networking Benefits: A Closer Look



The Ferrari Narrative

- Ferrari will stay an exclusive auto club, deriving its allure from its scarcity and the fact that only a few own Ferraris.
- By staying exclusive, the company gets three benefits:
 - It can continue to charge nose bleed prices for its cars and sell them with little or no advertising.
 - It does not need to invest in new assembly plants, since it does not plan to ramp up production.
 - It sells only to the super rich, who are unaffected by overall economic conditions or market crises.

The Alibaba Narrative: The China Story

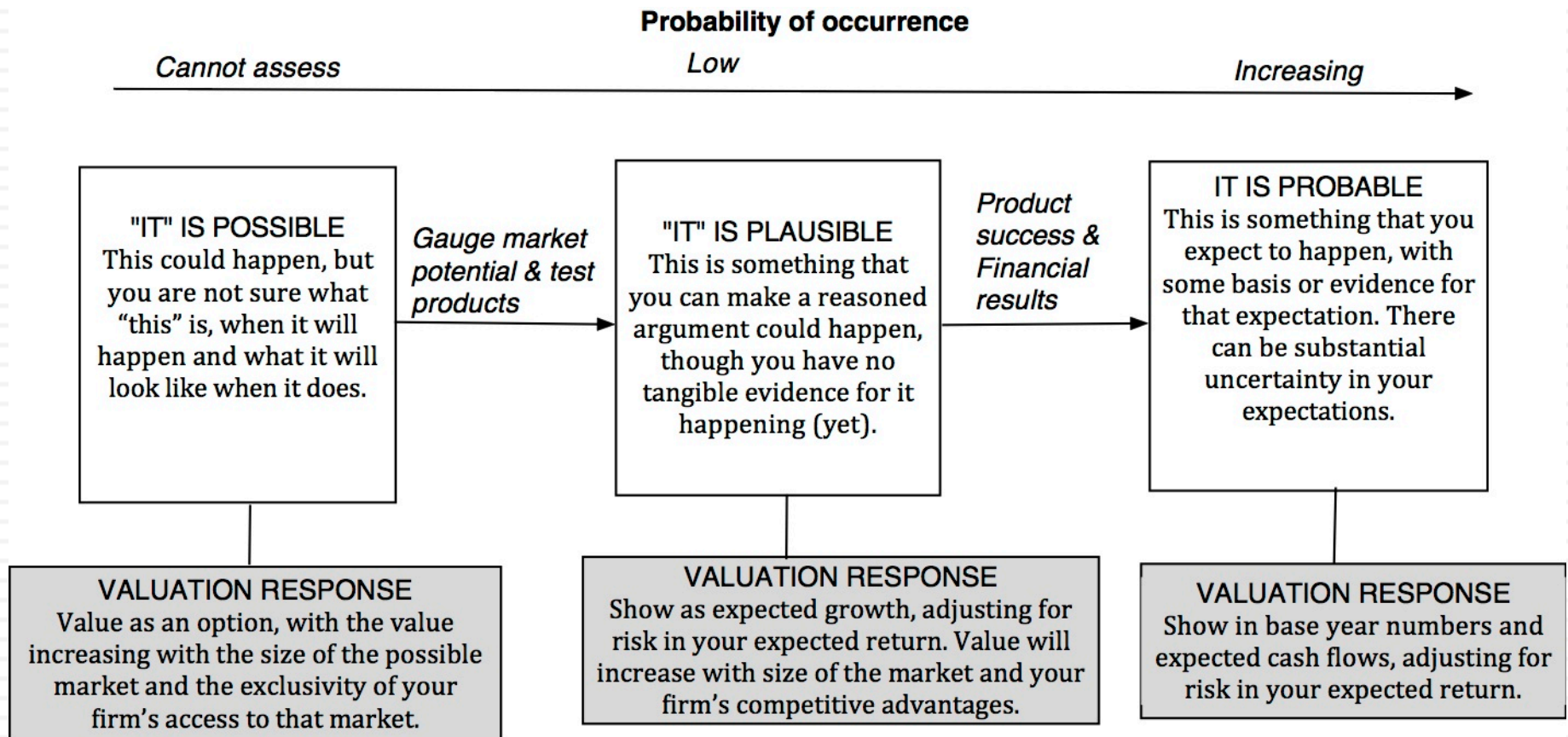


The Deutsche Bank Narrative

- Growth and Profits: Deutsche Bank is a very low growth bank, with risk-adjusted assets at the inflation low and a return on equity that will stay low for the near term, as it faces regulatory pressures and reputation shocks.
- Regulatory Capital: To recover, the company will have to issue massive amounts of new equity and in steady state, it will remain both high risk and require high regulatory capital to sustain itself.
- A Stable Bank that runs in place: Once recovered, the bank will generate a return on equity roughly equal to its cost of equity.
- Failure risk: There is a very real chance that the bank may need to be saved, in which case the equity will be wiped out.

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

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The Impossible, The Implausible and the Improbable

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The Impossible

Bigger than the economy
Assuming Growth rate for company in perpetuity > Growth rate for economy

Bigger than the total market
Allowing a company's revenues to grow so much that it has more than a 100% market share of whatever business it is in.

Profit margin > 100%
Assuming earnings growth will exceed revenue growth for a long enough period, and pushing margins above 100%

Depreciation without cap ex
Assuming that depreciation will exceed cap ex in perpetuity.

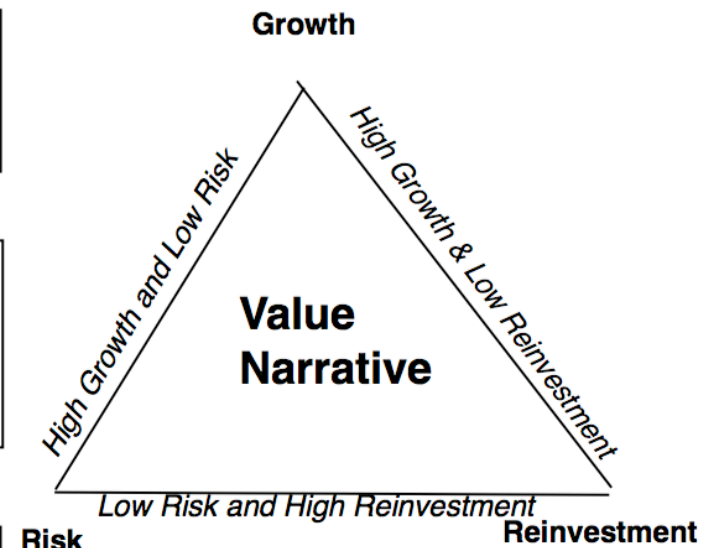
The Implausible

Growth without reinvestment
Assuming growth forever without reinvestment.

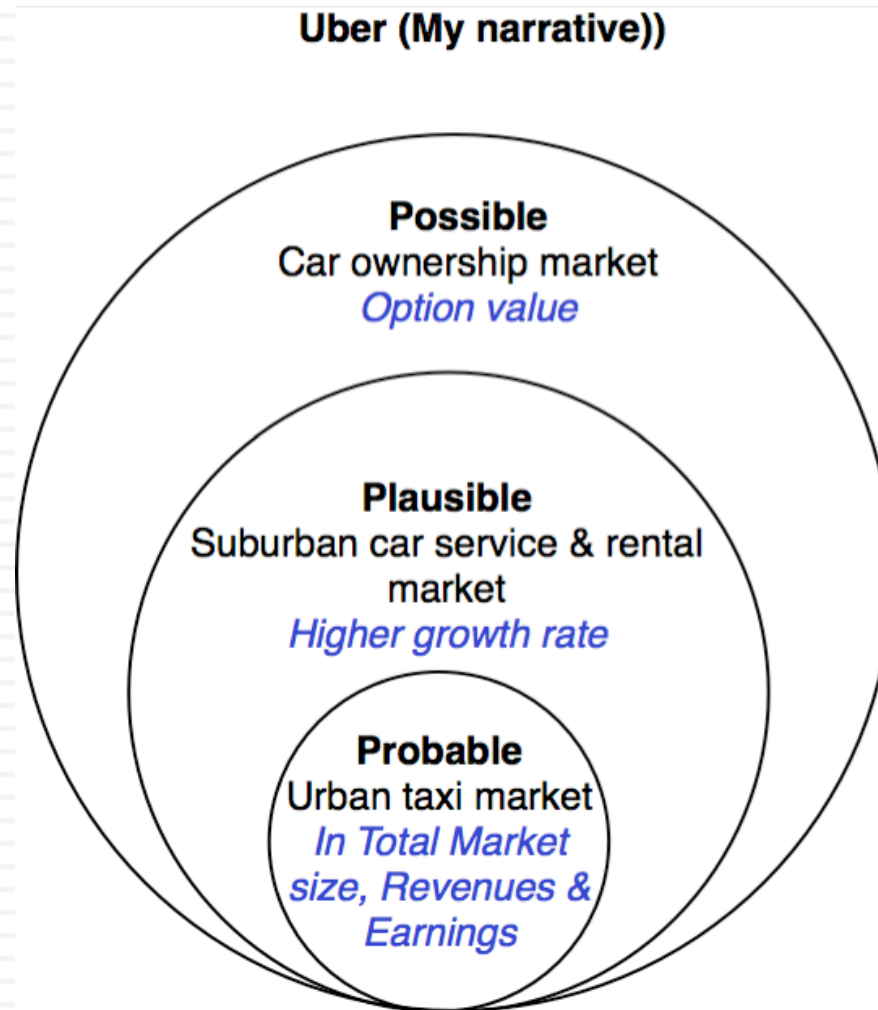
Profits without competition
Assuming that your company will grow and earn higher profits, with no competition.

Returns without risk
Assuming that you can generate high returns in a business with no risk.

The Improbable



Uber: Possible, Plausible and Probable



The Impossible: The Runaway Story

The Story



The Checks (?)

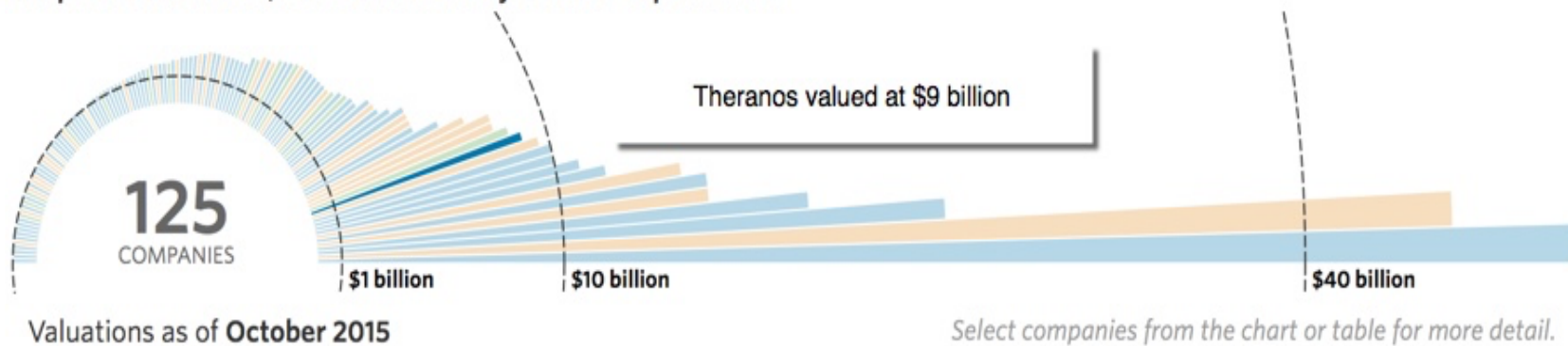
Board Member	Designation	Age
Henry Kissinger	Former Secretary of State	92
Bill Perry	Former Secretary of Defense	88
George Schultz	Former Secretary of State	94
Bill Frist	Former Senate Majority Leader	63
Sam Nunn	Former Senator	77
Gary Roughead	Former Navy Admiral	64
James Mattis	Former Marine Corps General	65
Dick Kovocovich	Former CEO of Wells Fargo	72
Riley Bechtel	Former CEO of Bechtel	63
William Foege	Epidemiologist	79
Elizabeth Holmes	Founder & CEO, Theranos	31
Sunny Balwani	President & COO, Theranos	NA

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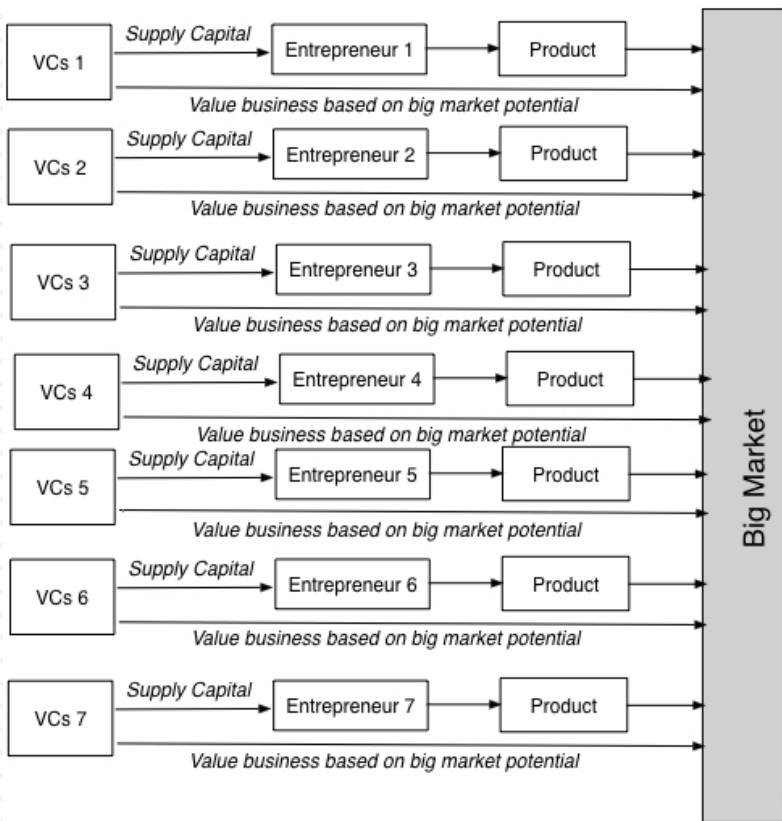
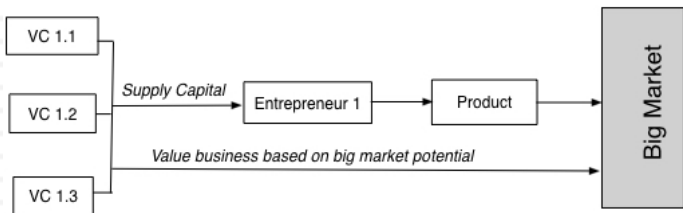
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Money

Companies valued at \$1 billion or more by venture-capital firms



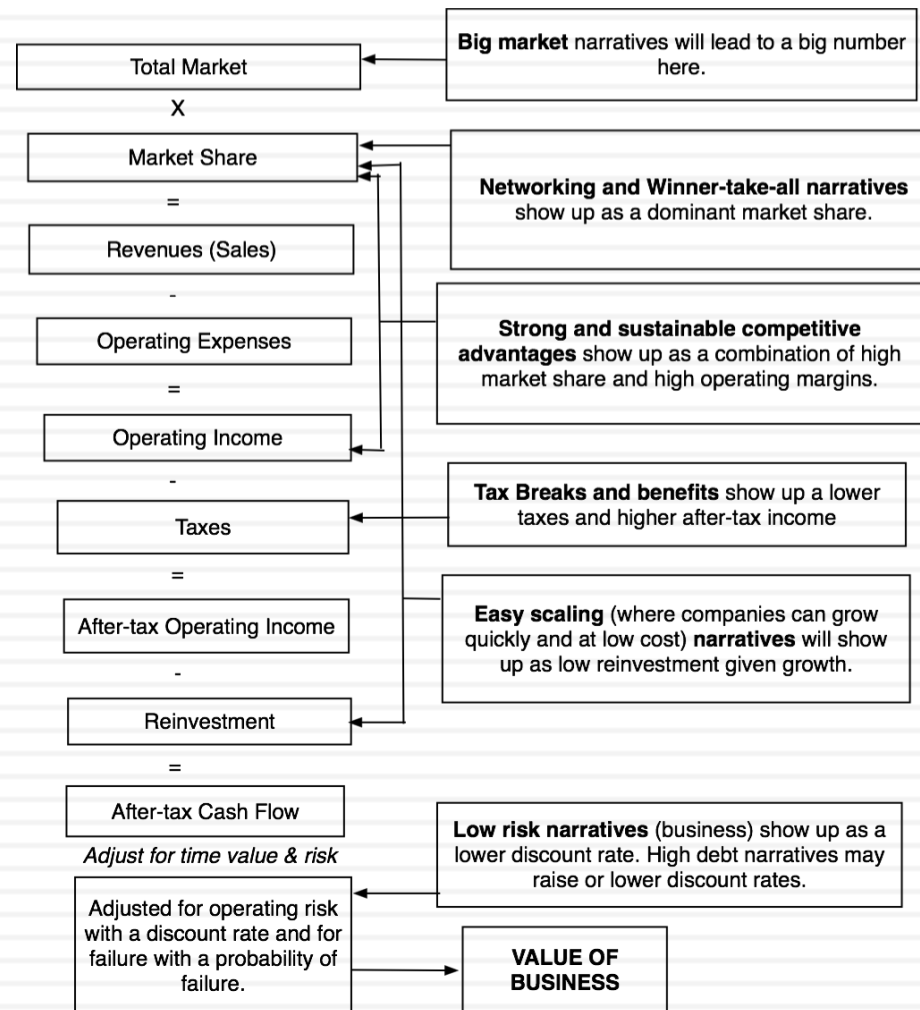
The Implausible: The Big Market Delusion



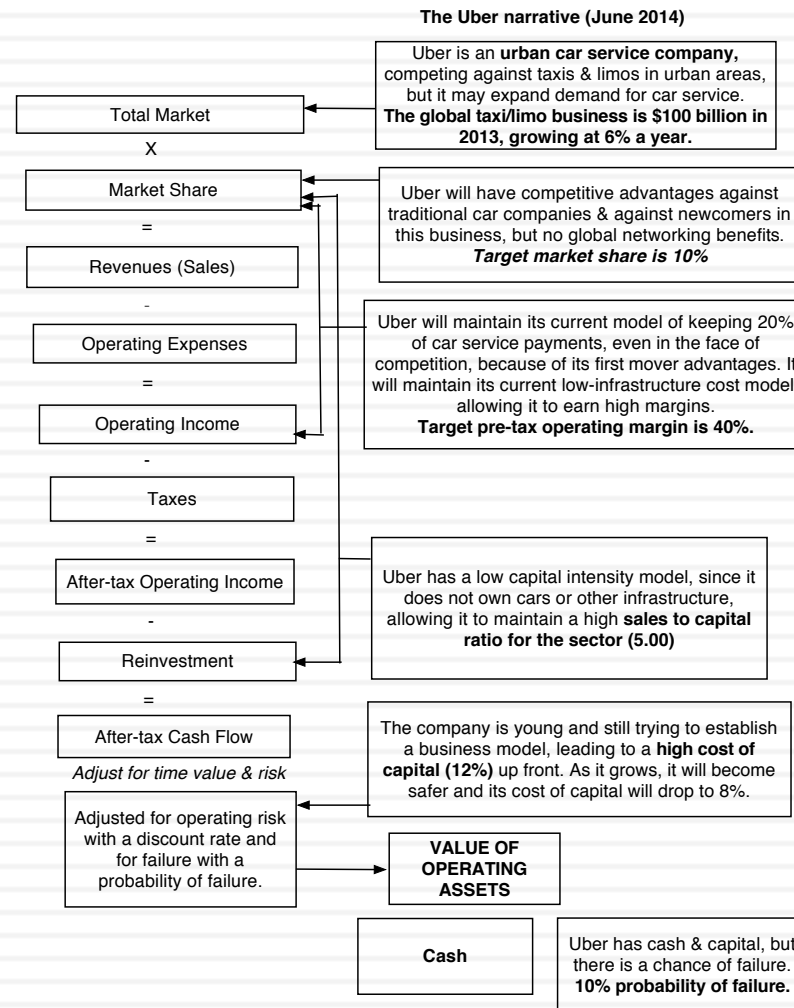
Company	Market Cap	Enterprise Value	Current Revenues	Breakeven Revenues (2025)	% from Online Advertising	Imputed Online Ad Revenue (2025)
Google	\$441,572.00	\$386,954.00	\$69,611.00	\$224,923.20	89.50%	\$201,306.26
Facebook	\$245,662.00	\$234,696.00	\$14,640.00	\$129,375.54	92.20%	\$119,284.25
Yahoo!	\$30,614.00	\$23,836.10	\$4,871.00	\$25,413.13	100.00%	\$25,413.13
LinkedIn	\$23,265.00	\$20,904.00	\$2,561.00	\$22,371.44	80.30%	\$17,964.26
Twitter	\$16,927.90	\$14,912.90	\$1,779.00	\$23,128.68	89.50%	\$20,700.17
Pandora	\$3,643.00	\$3,271.00	\$1,024.00	\$2,915.67	79.50%	\$2,317.96
Yelp	\$1,765.00	\$0.00	\$465.00	\$1,144.26	93.60%	\$1,071.02
Zillow	\$4,496.00	\$4,101.00	\$480.00	\$4,156.21	18.00%	\$748.12
Zynga	\$2,241.00	\$1,142.00	\$752.00	\$757.86	22.10%	\$167.49
Total US	\$770,185.90	\$689,817.00	\$96,183.00	\$434,185.98		\$388,972.66
Alibaba	\$184,362.00	\$173,871.00	\$12,598.00	\$111,414.06	60.00%	\$66,848.43
Tencent	\$154,366.00	\$151,554.00	\$13,969.00	\$63,730.36	10.50%	\$6,691.69
Baidu	\$49,991.00	\$44,864.00	\$9,172.00	\$30,999.49	98.90%	\$30,658.50
Sohu.com	\$18,240.00	\$17,411.00	\$1,857.00	\$16,973.01	53.70%	\$9,114.51
Naver	\$13,699.00	\$12,686.00	\$2,755.00	\$12,139.34	76.60%	\$9,298.74
Yandex	\$3,454.00	\$3,449.00	\$972.00	\$2,082.52	98.80%	\$2,057.52
Yahoo! Japan	\$23,188.00	\$18,988.00	\$3,591.00	\$5,707.61	69.40%	\$3,961.08
Sina	\$2,113.00	\$746.00	\$808.00	\$505.09	48.90%	\$246.99
Netease	\$14,566.00	\$11,257.00	\$2,388.00	\$840.00	11.90%	\$3,013.71
Mail.ru	\$3,492.00	\$3,768.00	\$636.00	\$1,676.47	35.00%	\$586.76
Mixi	\$3,095.00	\$2,661.00	\$1,229.00	\$777.02	96.00%	\$745.94
Kakaku	\$3,565.00	\$3,358.00	\$404.00	\$1,650.49	11.60%	\$191.46
Total non-US	\$474,131.00	\$444,613.00	\$50,379.00	\$248,495.46		\$133,415.32
Global Total	\$1,244,316.90	\$1,134,430.00	\$146,562.00	\$682,681.44		\$522,387.98



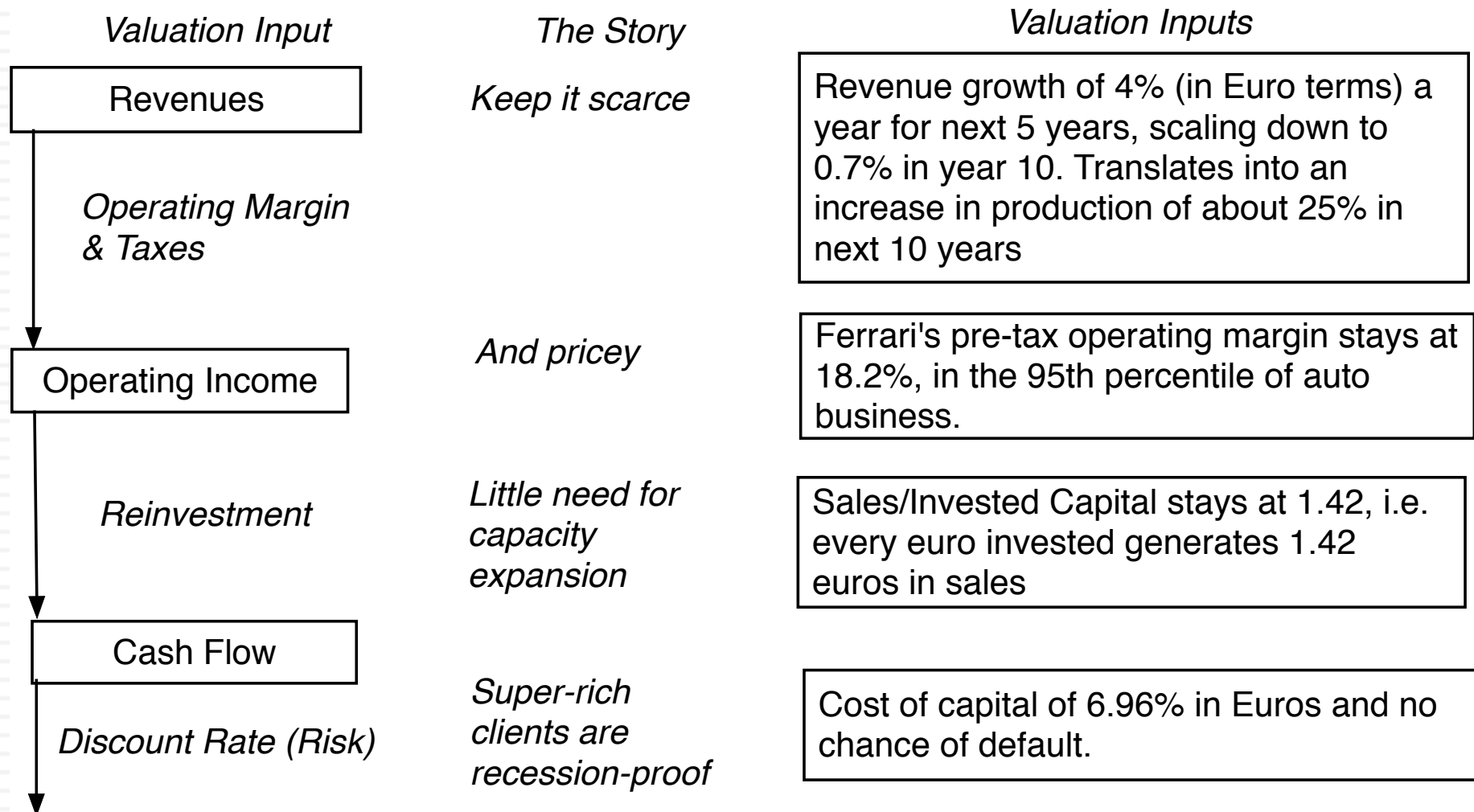
Step 4a: Connect your narrative to key drivers of value



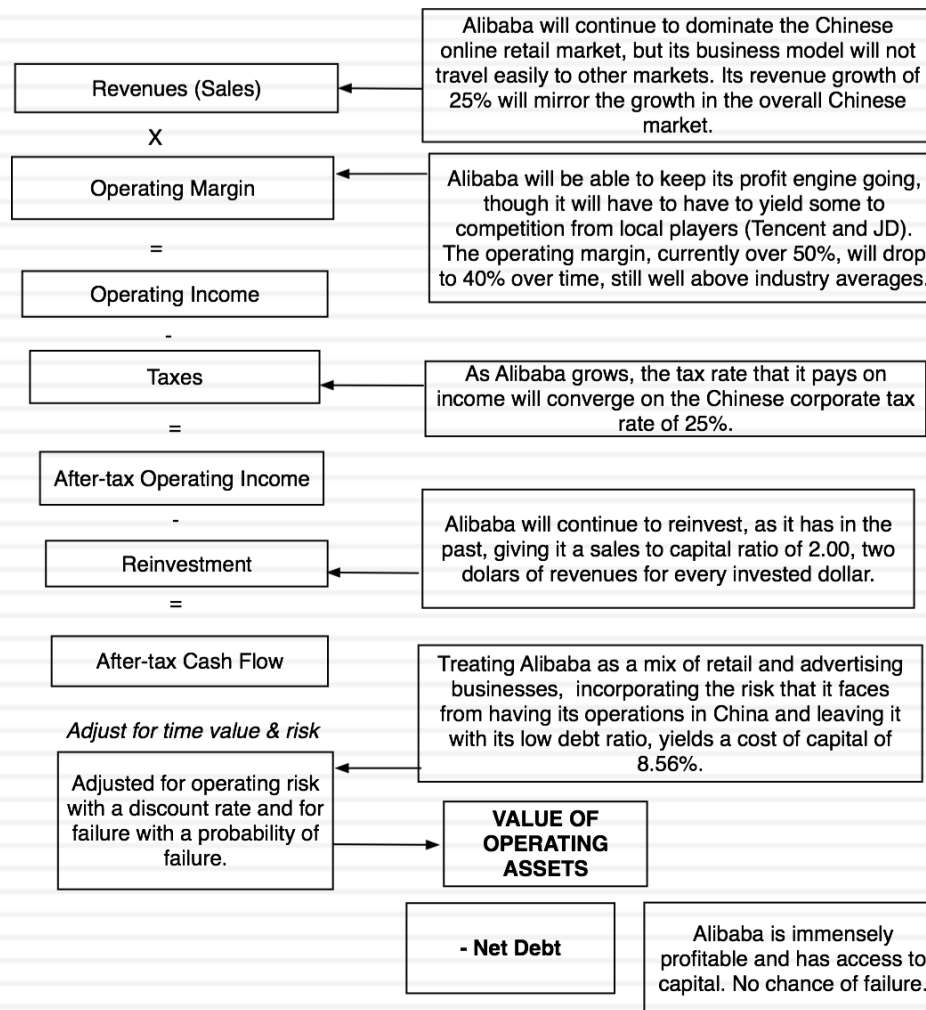
The Uber Link



Ferrari: From story to numbers



The Alibaba Revenue/Margin Inputs



The Deutsche Bank Inputs

My story for Deutsche Bank

Risk Adjusted Assets

Slow growing: The growth in risk adjusted assets will be 1% a year for the next 10 years.

Return on Equity

Clawback to profitability: After losses in next 2 years, ROE will improve to 5.85% (25th percentile of banks) in year 5 and 9.44% (Deutsche Bank's cost of equity in stable period) in year 10

Tier 1 Capital

Regulatory Capital Shock/Reaction: After paying DOJ fine, Deutsche will be severely undercapitalized. It will have to raise new equity and will shoot to reach 15.67% (75th percentile of banks) in year 10.

Cost of Equity

Risky Bank: The cost of equity for Deutsche initially will be 10.2% (75th percentile of banks) but will decrease gradually to 9.44% (the median cost of equity for banks) in 10 years.

Catastrophic Failure

Failure Risk: There is a 10% chance that the German government will have to bailout the bank, leading to the wiping out of equity.

Step 4b: Value the company (Uber)

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 Value₁₀ = 793 / (.08 - 0.025) = \$14,418

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

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.

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

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

Uber's 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

Value of operating assets = \$6,595

Adjust 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.

Ferrari: The “Exclusive Club” Value

Stay Super Exclusive: Revenue growth is low

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		4.00%	4.00%	4.00%	4.00%	4.00%	3.34%	2.68%	2.02%	1.36%	0.70%	0.70%
Revenues	€ 2,763	€ 2,874	€ 2,988	€ 3,108	€ 3,232	€ 3,362	€ 3,474	€ 3,567	€ 3,639	€ 3,689	€ 3,714	€ 3,740
EBIT (Operating) margin	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%
EBIT (Operating income)	€ 503	€ 523	€ 544	€ 566	€ 588	€ 612	€ 632	€ 649	€ 662	€ 671	€ 676	€ 681
Tax rate	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%
EBIT(1-t)	€ 334	€ 348	€ 361	€ 376	€ 391	€ 407	€ 420	€ 431	€ 440	€ 446	€ 449	€ 452
- Reinvestment		€ 78	€ 81	€ 84	€ 87	€ 91	€ 79	€ 66	€ 51	€ 35	€ 18	€ 22
FCFF		€ 270	€ 281	€ 292	€ 303	€ 316	€ 341	€ 366	€ 389	€ 411	€ 431	€ 431
Cost of capital		6.96%	6.96%	6.96%	6.96%	6.96%	6.96%	6.97%	6.98%	6.99%	7.00%	7.00%
PV(FCFF)		€ 252	€ 245	€ 238	€ 232	€ 225	€ 228	€ 228	€ 227	€ 224	€ 220	
Terminal value	€ 6,835											
PV(Terminal value)	€ 3,485											
PV (CF over next 10 years)	€ 2,321											
Value of operating assets =	€ 5,806											
- Debt	€ 623											
- Minority interests	€ 13											
+ Cash	€ 1,141											
Value of equity	€ 6,311											

High Prices
+ No selling
cost =
Preserve
current
operating
margin

Minimal
Reinvestment
due to low
growth

The super
rich are not
sensitive to
economic
downturns

Alibaba, the China Story (September 2014, just before IPO)

Alibaba will stay China-centric, maintaining its high market share and growing with the Chinese online retail market. It's margins will come down because of competition but still stay high.

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

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

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

Sales to capital ratio maintained at 2.00

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

Terminal Value₁₀ = $10,353 / (.08 - 0.0241) = \$185,198$

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

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

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

Cost of capital = $8.90\% (.943) + 3.00\% (.057) = 8.56\%$
 Cost of capital decreases to 8% from years 6-10

Cost of Equity 8.90%
Cost of Debt 4% (1-.25) = 3.00%
Weights E = 94.3% D = 5.7%

Riskfree Rate: Riskfree rate = 2.41%
 + **Beta** 1.092 X **ERP** 5.94%

Unlevered Beta: 1.044 (70% advertising, 30% online retailing) D/E = 6.07%

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

Alibaba will continue to be in two businesses, advertising and retailing, and retain its existing China focus.

Deutsche Bank: A Crisis Valuation (October 2016)

Risk adjusted assets grows at inflation rate of 1% a year forever.

Tier 1 capital ratio increases to 15.67%, the 75th percentile for all banks

Expected DOJ fine of \$10 billions lower Tier 1 capital today

Common Equity increases in tandem with Tier 1 capital

Cost of equity starts at 10.2% (75th percentile of banks) & decreases after year 5 to 9.44% (median across banks).

	Current	1	2	3	4	5	6	7	8	9	10
Risk Adjusted Assets	\$ 445,570	\$ 450,026	\$ 454,526	\$ 459,071	\$ 463,662	\$ 468,299	\$ 472,982	\$ 477,711	\$ 482,488	\$ 487,313	\$ 492,186
Tier 1 Capital Ratio	12.41%	13.74%	13.95%	14.17%	14.38%	14.60%	14.81%	15.03%	15.24%	15.46%	15.67%
Tier 1 Capital (Risk Adjusted Assets * Tier 1 Capital Ratio)	\$55,282	\$61,834	\$63,427	\$65,045	\$66,690	\$68,361	\$70,059	\$71,784	\$73,537	\$75,317	\$77,126
Change in regulatory capital (Tier 1)		\$6,552	\$1,593	\$1,619	\$1,645	\$1,671	\$1,698	\$1,725	\$1,753	\$1,780	\$1,809
Book Equity	\$64,609	\$71,161	\$72,754	\$74,372	\$76,017	\$77,688	\$79,386	\$81,111	\$82,864	\$84,644	\$86,453
Expected ROE	-13.70%	-7.18%	-2.84%	0.06%	1.99%	5.85%	6.568%	7.286%	8.004%	8.722%	9.440%
Net Income (Book Equity * ROE)	\$ (8,851)	\$ (5,111)	\$ (2,065)	\$ 43	\$ 1,512	\$ 4,545	\$ 5,214	\$ 5,910	\$ 6,632	\$ 7,383	\$ 8,161
- Investment in Regulatory Capital		\$ 6,552	\$ 1,593	\$ 1,619	\$ 1,645	\$ 1,671	\$ 1,698	\$ 1,725	\$ 1,753	\$ 1,780	\$ 1,809
FCFE		\$ (11,663)	\$ (3,658)	\$ (1,576)	\$ (133)	\$ 2,874	\$ 3,516	\$ 4,185	\$ 4,880	\$ 5,602	\$ 6,352
Terminal value of equity											\$87,317
Present value		\$ (10,583)	\$ (3,012)	\$ (1,178)	\$ (90)	\$ 1,768	\$ 1,966	\$ 2,129	\$ 2,262	\$ 2,370	\$ 36,207
Cost of equity	10.20%	10.20%	10.20%	10.20%	10.20%	10.20%	10.048%	9.896%	9.744%	9.592%	9.440%
Cumulative Cost of equity		1.1020	1.2144	1.3383	1.4748	1.6252	1.7885	1.9655	2.1570	2.3639	2.5871
Value of equity today =	\$31,838.74										
Number of shares outstanding =	1386.00										
DCF Value per share =	\$ 22.97										
Probability of equity wipeout	10.00%										
Adjusted value per share =	\$ 20.67										
Stock price on October 3, 2016 =	\$ 13.33										

Value per share adjusted for probability of catastrophic failure (bailout) resulting in complete loss of equity.

Return on equity increases to 5.85% (25th percentile of banks) in year 5 and 9.44% (cost of equity) in year 10

Step 5: Keep the feedback loop open

- When you tell a story about a company (either explicitly or implicitly), it is natural to feel attached to that story and to defend it against all attacks. Nothing can destroy an investor more than hubris.
- Being open to other views about a company is not easy, but here are some suggestions that may help:
 - ▣ Face up to the uncertainty in your own estimates of value.
 - ▣ Present the valuation to people who don't think like you do.
 - ▣ Create a process where people who disagree with you the most have a say.
 - ▣ Provide a structure where the criticisms can be specific and pointed, rather than general.

The Uber Feedback Loop: Bill Gurley

45

1. Not just car service company.: Uber is a car company, not just a car service company, and there may be a day when consumers will subscribe to a Uber service, rather than own their own cars. It could also expand into logistics, i.e., moving and transportation businesses.
2. Not just urban: Uber can create new demands for car service in parts of the country where taxis are not used (suburbia, small towns).
3. Global networking benefits: By linking with technology and credit card companies, Uber can have global networking benefits.

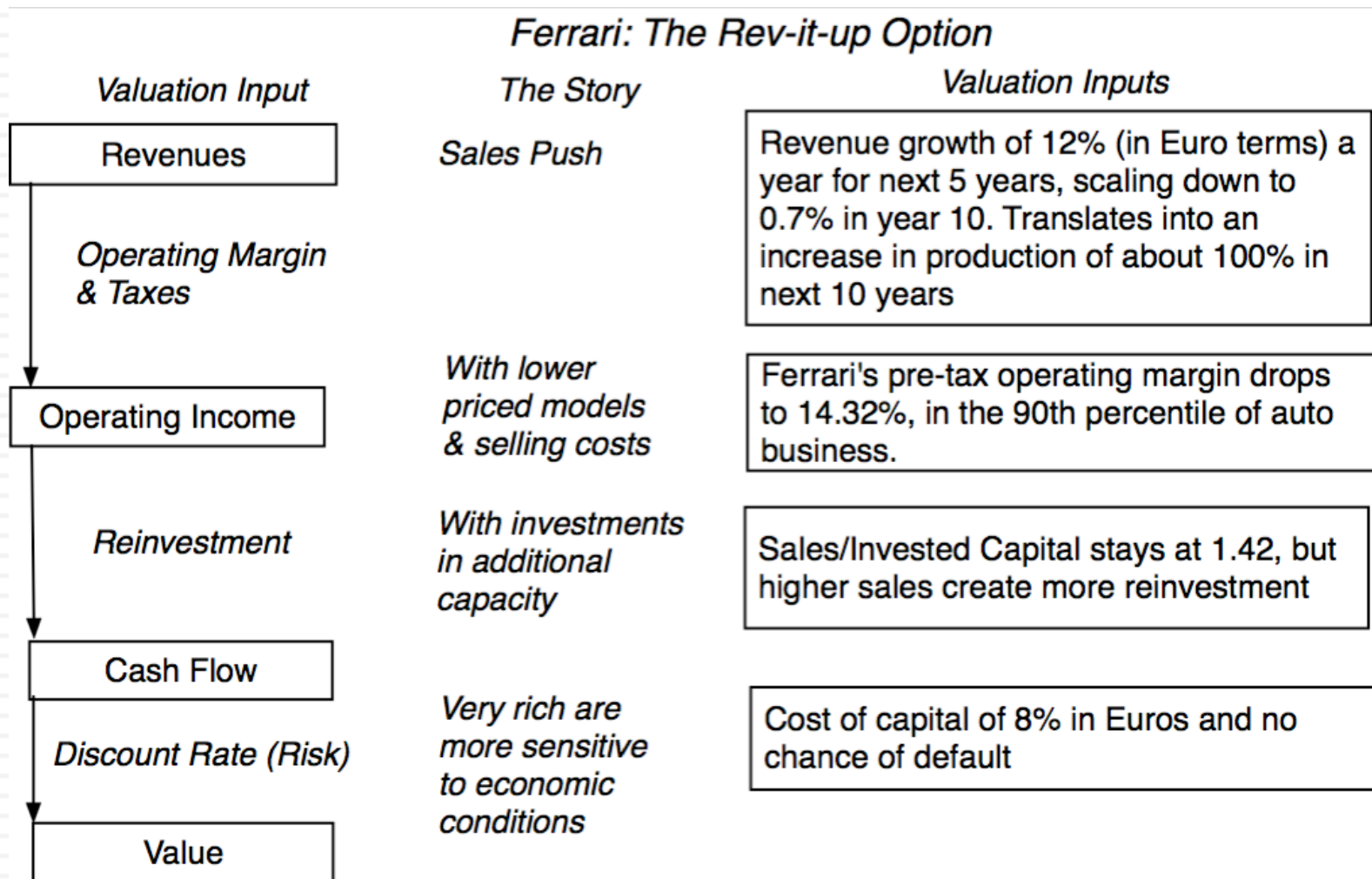
Valuing Bill Gurley's Uber narrative

	<i>Uber (Gurley)</i>	<i>Uber (Gurley Mod)</i>	<i>Uber (Damodaran)</i>
Narrative	Uber will <u>expand the car service market substantially</u> , bringing in mass transit users & non-users from the suburbs into the market, and use its <u>networking advantage</u> to gain a <u>dominant market share</u> , while maintaining its revenue slice at 20%.	Uber will <u>expand the car service market substantially</u> , bringing in mass transit users & non-users from the suburbs into the market, and use its <u>networking advantage</u> to gain a <u>dominant market share</u> , while cutting prices and margins (to 10%).	Uber will expand the car service market moderately, primarily in urban environments, and use its <u>competitive advantages</u> to get a <u>significant but not dominant market share</u> 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)

Different narratives, Different Numbers

<i>Total Market</i>	<i>Growth Effect</i>	<i>Network Effect</i>	<i>Competitive Advantages</i>	<i>Value of Uber</i>
A4. Mobility Services	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	\$90,457
A3. Logistics	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	\$65,158
A4. Mobility Services	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	\$52,346
A2. All car service	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	\$47,764
A1. Urban car service	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	\$31,952
A3. Logistics	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	\$14,321
A1. Urban car service	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	\$7,127
A2. All car service	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	\$4,764
A4. Mobility Services	B1. None	C1. No network effects	D1. None	\$1,888
A3. Logistics	B1. None	C1. No network effects	D1. None	\$1,417
A2. All car service	B1. None	C1. No network effects	D1. None	\$1,094
A1. Urban car service	B1. None	C1. No network effects	D1. None	\$799

The Ferrari Counter Narrative



Ferrari: The “Rev-it-up” Alternative

Get less exclusive: Double number of cars sold over next decade

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		12.00%	12.00%	12.00%	12.00%	12.00%	9.74%	7.48%	5.22%	2.96%	0.70%	0.70%
Revenues	€ 2,763	€ 3,095	€ 3,466	€ 3,882	€ 4,348	€ 4,869	€ 5,344	€ 5,743	€ 6,043	€ 6,222	€ 6,266	€ 6,309
EBIT (Operating) margin	18.20%	17.81%	17.42%	17.04%	16.65%	16.26%	15.87%	15.48%	15.10%	14.71%	14.32%	14.32%
EBIT (Operating income)	€ 503	€ 551	€ 604	€ 661	€ 724	€ 792	€ 848	€ 889	€ 912	€ 915	€ 897	€ 904
Tax rate	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%
EBIT(1-t)	€ 334	€ 366	€ 401	€ 439	€ 481	€ 526	€ 564	€ 591	€ 606	€ 608	€ 596	€ 600
- Reinvestment		€ 233	€ 261	€ 293	€ 328	€ 367	€ 334	€ 281	€ 211	€ 126	€ 31	€ 35
FCFF		€ 133	€ 140	€ 147	€ 153	€ 159	€ 230	€ 310	€ 395	€ 482	€ 566	€ 565
Cost of capital		8.00%	8.00%	8.00%	8.00%	8.00%	7.90%	7.80%	7.70%	7.60%	7.50%	7.50%
PV(FCFF)		€ 123	€ 120	€ 117	€ 113	€ 108	€ 145	€ 181	€ 215	€ 244	€ 266	
Terminal value	€ 8,315											
PV(Terminal value)	€ 3,906											
PV (CF over next 10 years)	€ 1,631											
Value of operating assets =	€ 5,537											
- Debt	€ 623											
- Minority interests	€ 13											
+ Cash	€ 1,141											
Value of equity	€ 6,042											

Lower Prices + Some selling cost = Lower operating margin

Reinvestment reflects higher sales

The very rich are more sensitive to economic conditions

And the world is full of feedback.. My Ferrari afterthought!



Alibaba, the Global Story (September 2014, just before IPO)

Alibaba is able to expand into overseas markets, allowing its revenues to grow 40% a year for the next 5 years. Its profit margins will come under pressure as it competes in foreign markets and it will need to reinvest more to grow.

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

Revenue growth of **40%** a year for 5 years, tapering down to 2.63% in year 10

Pre-tax operating margin decreases to 30% over time & tax rate rises to 25%

Sales to capital ratio will be 1.50

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

Terminal Value₁₀ = $17,567 / (.08 - 0.0241) = \$314,292$

	1	2	3	4	5	6	7	8	9	10
Revenue growth rate	40.00%	40.00%	40.00%	40.00%	40.00%	32.48%	24.96%	17.45%	9.93%	2.41%
Revenues	\$ 12,975	\$ 18,165	\$ 25,431	\$ 35,604	\$ 49,846	\$ 66,036	\$ 82,522	\$ 96,918	\$ 106,540	\$ 109,108
EBIT (Operating) margin	48.66%	46.58%	44.51%	42.44%	40.36%	38.29%	36.22%	34.15%	32.07%	30.00%
EBIT (Operating income)	\$ 6,313	\$ 8,462	\$ 11,320	\$ 15,110	\$ 20,120	\$ 25,287	\$ 29,888	\$ 33,094	\$ 34,171	\$ 32,732
Tax rate	11.92%	11.92%	11.92%	11.92%	11.92%	14.54%	17.15%	19.77%	22.38%	25.00%
EBIT(1-t)	\$ 5,561	\$ 7,453	\$ 9,970	\$ 13,308	\$ 17,721	\$ 21,611	\$ 24,762	\$ 26,552	\$ 26,522	\$ 24,549
- Reinvestment	\$ 2,471	\$ 3,460	\$ 4,844	\$ 6,782	\$ 9,494	\$ 10,794	\$ 10,990	\$ 9,598	\$ 6,415	\$ 1,712
FCFF	\$ 3,089	\$ 3,993	\$ 5,126	\$ 6,527	\$ 8,227	\$ 10,817	\$ 13,772	\$ 16,954	\$ 20,107	\$ 22,838

Term yr
 EBIT (1-t) \$25,141
 - Reinv 7,574
 FCFF 17,567

Operating assets \$ 202,186
 + Cash 9330
 - Debt 10068
 + Equity investments 2,087
 + Alipay provision 3,000
 + IPO Proceeds (est) 20,000
 - Options 696
 Value of equity 225,839
 Value per share \$92.52

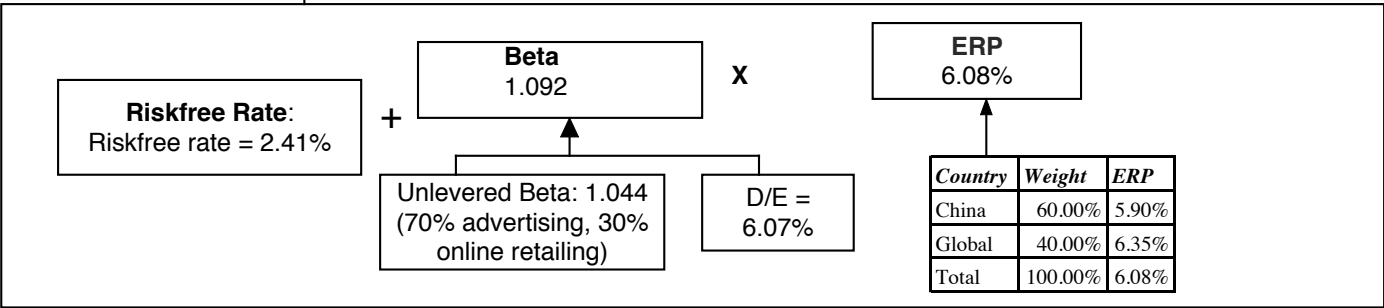
Cost of capital = $9.05\% (.943) + 3.00\% (.057) = 8.70\%$

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

Cost of Equity
9.05%

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

Weights
E = 94.3% D = 5.7%



Alibaba will continue to be in two businesses, advertising and retailing, but the proportion of revenues from the rest of the globe will increase.

Back to Amazon: An Optimistic Counter

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 **strongly** into media & cloud services to become the second largest retailer in the world. Revenues grow @20% a year for 5 years, tapering down to 2.2% growth after year 10

As Amazon becomes more dominant, it will increase prices, **with few restraints**. Operating margin improves to 12.84% in year 10, the 75th percentile of retail & media businesses

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

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		20.00%	20.00%	20.00%	20.00%	20.00%	16.44%	12.88%	9.32%	5.76%	2.20%	2.20%
Revenues	\$ 85,246	\$102,295	\$122,754	\$147,305	\$176,766	\$212,119	\$246,992	\$278,804	\$304,789	\$322,345	\$329,436	\$ 336,684
EBIT (Operating) margin	0.47%	1.71%	2.94%	4.18%	5.42%	6.65%	7.89%	9.13%	10.37%	11.60%	12.84%	12.84%
EBIT (Operating income)	\$ 400	\$ 1,746	\$ 3,613	\$ 6,158	\$ 9,576	\$ 14,116	\$ 19,492	\$ 25,451	\$ 31,594	\$ 37,401	\$ 42,300	\$ 43,230
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)	\$ 273	\$ 1,190	\$ 2,464	\$ 4,200	\$ 6,531	\$ 9,627	\$ 13,293	\$ 17,358	\$ 21,547	\$ 25,508	\$ 28,848	\$ 29,483
- Reinvestment		\$ 4,632	\$ 5,559	\$ 6,670	\$ 8,004	\$ 9,605	\$ 9,475	\$ 8,643	\$ 7,060	\$ 4,770	\$ 1,927	\$ 5,405
FCFF		-\$ 3,442	-\$ 3,094	-\$ 2,470	-\$ 1,473	\$ 22	\$ 3,819	\$ 8,715	\$ 14,487	\$ 20,738	\$ 26,922	\$ 24,078
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%
Cumulated discount factor		0.9226	0.8511	0.7852	0.7244	0.6683	0.6170	0.5700	0.5271	0.4877	0.4515	
PV(FCFF)		\$3,175	\$2,634	\$1,940	\$1,067	\$15	\$2,356	\$4,968	\$7,636	\$10,113	\$12,156	

Terminal value	\$415,134.21
PV(Terminal value)	\$187,447.77
PV (CF over next 10 years)	\$ 28,427.49
Value of operating assets =	\$215,875.26
- Debt	\$ 9,201.58
+ Cash	\$ 10,252.00
+ Non-operating assets	\$ -
Value of equity	\$216,925.67
- Value of options	\$ -
Value of equity in common stock	216,925.67
Number of shares	463.01
Estimated value /share	\$ 468.51

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 business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

Amazon: An Optimistic (Conspiratorial) Valuation in late October 2014

And a pessimistic one..

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 services 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

Easy entry into the business will push margins down for everyone: Operating margin stays at 2.85% in year 10, in the 25th percentile of retail company margins

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

	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	0.47%	0.71%	0.95%	1.18%	1.42%	1.66%	1.90%	2.14%	2.37%	2.61%	2.85%	2.85%
EBIT (Operating income)	\$ 400	\$ 693	\$ 1,066	\$ 1,534	\$ 2,120	\$ 2,846	\$ 3,659	\$ 4,524	\$ 5,397	\$ 6,221	\$ 6,937	\$ 7,090
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)	\$ 273	\$ 473	\$ 727	\$ 1,046	\$ 1,446	\$ 1,941	\$ 2,495	\$ 3,086	\$ 3,681	\$ 4,243	\$ 4,731	\$ 4,835
- Reinvestment		\$ 3,474	\$ 3,995	\$ 4,594	\$ 5,284	\$ 6,076	\$ 5,795	\$ 5,175	\$ 4,213	\$ 2,940	\$ 1,424	\$ 1,064
FCFF		\$ (3,001)	\$ (3,268)	\$ (3,548)	\$ (3,838)	\$ (4,136)	\$ (3,300)	\$ (2,089)	\$ (532)	\$ 1,302	\$ 3,307	\$ 3,771
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%
Cumulated discount factor		0.9226	0.8511	0.7852	0.7244	0.6683	0.6170	0.5700	0.5271	0.4877	0.4515	
PV(FCFF)		-\$2,768.76	-\$2,711.71	-\$2,785.95	-\$2,780.38	-\$2,763.78	-\$2,036.06	-\$1,191.09	-\$ 280.58	\$ 635.12	\$1,493.45	

PV(Terminal value)	\$29,361
PV (CF over next 10 years)	\$15,260
Value of operating assets =	\$14,101
- Debt	\$9,202
+ Cash	\$10,252
Value of equity	\$15,151
- Value of options	\$0
Value of equity in common stock	\$ 15,151
Number of shares	463.01
Estimated value /share	\$ 32.72

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 business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

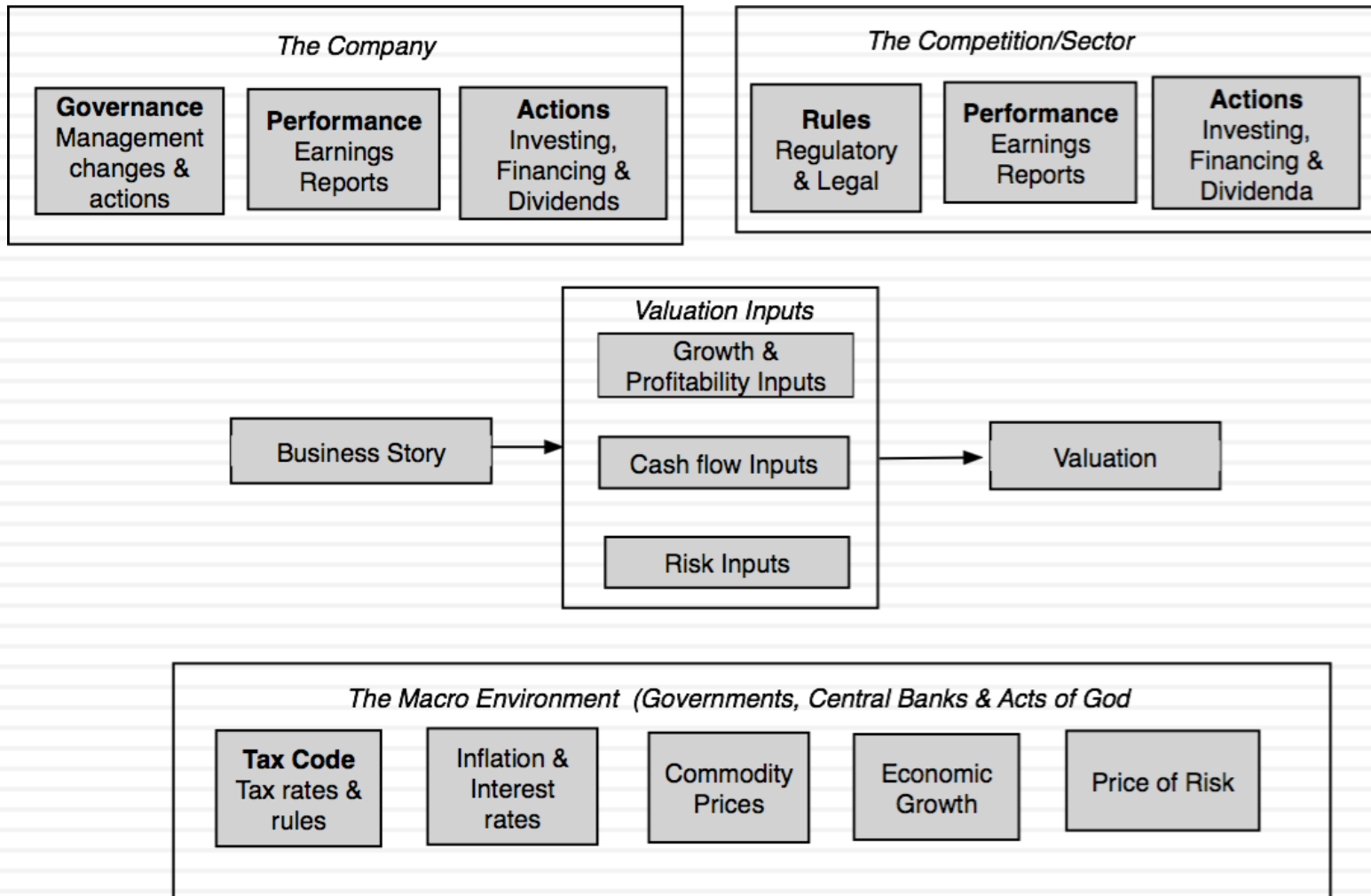
Amazon: The Doomsday in late October 2014

Narrative breaks, shifts & changes

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

Lord Keynes

Why narratives change



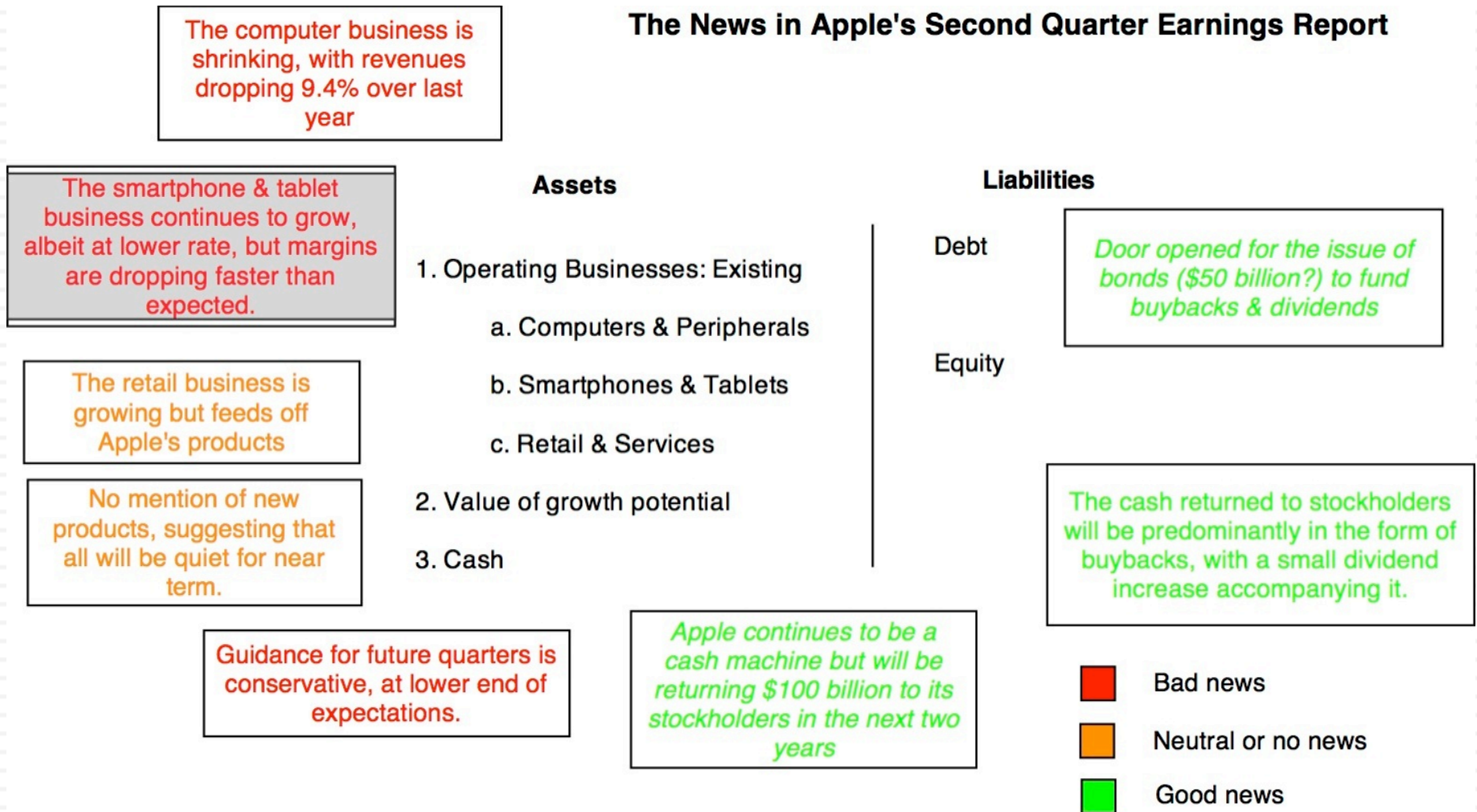
How narratives change

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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

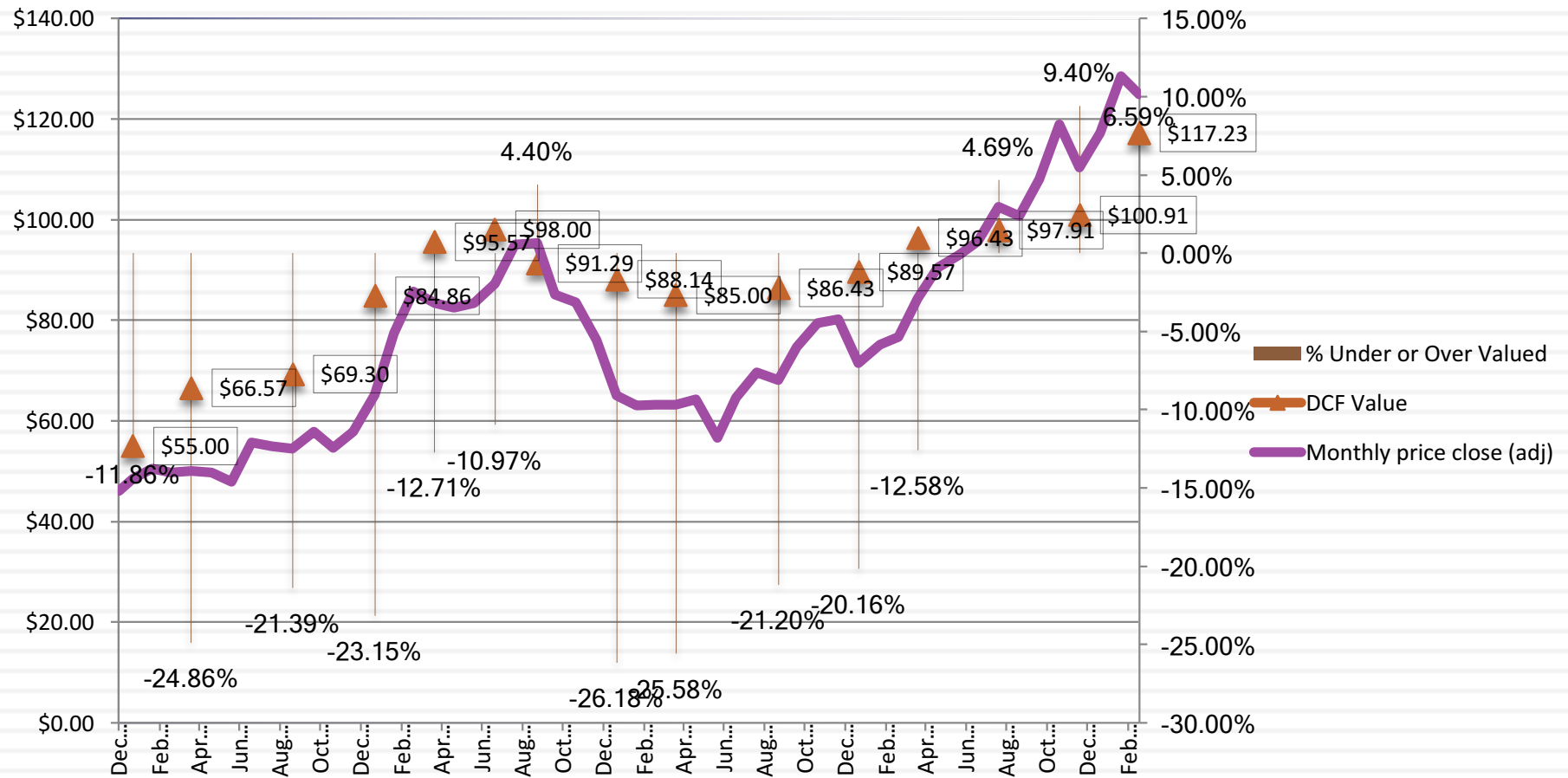
Earnings Reports and Stories: Apple's earnings report in October 2013

The News in Apple's Second Quarter Earnings Report



Sometimes your story does not change..

Apple, Price and Value - 2010 to 2015



And sometimes it does.. Facebook's Evolution

Report Date	Active Users	Mobile Active Users	% of revenue from Mobile	Net Income	Capital	T12m Sales/Capital
7/26/12	955	543	NR	(\$157)	\$3,515	1.23
10/23/12	1010	604	NR	(\$59)	\$4,252	1.09
1/30/13	1060	680	23.00%	\$64	\$4,120	1.24
5/1/13	1100	751	30.00%	\$219	\$4,272	1.28
7/24/13	1150	819	41.00%	(\$152)	\$3,948	1.55
10/30/13	1190	874	49.00%	\$425	\$4,007	1.71
1/29/14	1230	945	53.00%	\$523	\$4,258	1.85
4/23/14	1280	1010	59.00%	\$642	\$4,299	2.07
7/23/14	1320	1070	62.00%	\$791	\$4,543	2.20

Uber: The September 2015 Update

<i>Input</i>	<i>June 2014</i>	<i>September 2015</i>	<i>Rationale</i>
Total Market	\$100 billion; Urban car service	\$230 billion; Logistics	Market is broader, bigger & more global than I thought it would be. <u>Uber's</u> entry into delivery & moving businesses is now plausible, perhaps even probable.
Growth in market	Increase market size by 34%; CAGR of 6%.	Double market size; CAGR of 10.39%.	New customers being drawn to car sharing, with more diverse offerings.
Market Share	10% (Local Networking)	25% (Weak Global Networking)	Higher cost of entry will reduce competitors, but remaining competitors have access to capital & in Asia, the hometown advantage.
Slice of gross receipts	20% (Left at status quo)	15%	Increased competition will reduce car service company slice.
Operating margin	40% (Low cost model)	25% (Partial employee model)	Drivers will become partial employees, higher insurance and regulatory costs.
Cost of capital	12% (Ninth <u>decile</u> of US companies)	10% (75 th percentile of US companies)	Business model in place and substantial revenues.
Probability of failure	10%	0%	Enough cash on hand to find off threats to survival.
Value of equity	\$5.9 billion	\$23.4 billion	Value increased more than four fold.

Potential Market	Market size (in millions)
A1. Urban car service	\$100,000
A2. All car service	\$175,000
A3. Logistics	\$230,000
A4. Mobility Services	\$310,000

Growth Effect	CAGR (next 10 years)
B1. None	3.00%
B2. Increase market by 25%	5.32%
B3. Increase market size by 50%	7.26%
B4: Double market size	10.39%

Network Effects	Market Share
C1. No network effects	5%
C2. Weak local network effects	10%
C3. Strong local network effects	15%
C4. Weak global network effects	25%
C5. Strong global network effects	40%

Increases overall market to \$618 billion in year 10

	Base	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Assumptions
Overall market	\$230,000	\$253,897	\$280,277	\$309,398	\$341,544	\$377,031	\$416,204	\$459,448	\$507,184	\$559,881	\$618,052	A3 & B4
Share of market (gross)	4.71%	6.74%	8.77%	10.80%	12.83%	14.86%	16.89%	18.91%	20.94%	22.97%	25.00%	C4
Gross Billings	\$10,840	\$17,117	\$24,582	\$33,412	\$43,813	\$56,014	\$70,277	\$86,900	\$106,218	\$128,612	\$154,513	
Revenues as percent of gross	20.00%	19.50%	19.00%	18.50%	18.00%	17.50%	17.00%	16.50%	16.00%	15.50%	15.00%	D3
Annual Revenue	\$2,168	\$3,338	\$4,670	\$6,181	\$7,886	\$9,802	\$11,947	\$14,338	\$16,995	\$19,935	\$23,177	
Operating margin	-23.06%	-18.26%	-13.45%	-8.64%	-3.84%	0.97%	5.77%	10.58%	15.39%	20.19%	25.00%	E2
Operating Income	-\$500	-\$609	-\$628	-\$534	-\$303	\$95	\$690	\$1,517	\$2,615	\$4,026	\$5,794	
Effective tax rate	30.00%	31.00%	32.00%	33.00%	34.00%	35.00%	36.00%	37.00%	38.00%	39.00%	40.00%	
- Taxes	-\$150	-\$189	-\$201	-\$176	-\$103	\$33	\$248	\$561	\$994	\$1,570	\$2,318	
After-tax operating income	-\$350	-\$420	-\$427	-\$358	-\$200	\$62	\$442	\$956	\$1,621	\$2,456	\$3,477	
Sales/Capital Ratio		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	F
- Reinvestment		\$234	\$267	\$302	\$341	\$383	\$429	\$478	\$531	\$588	\$648	
Free Cash Flow to the Firm		-\$654	-\$694	-\$660	-\$541	-\$322	\$13	\$478	\$1,090	\$1,868	\$2,828	
Terminal value											\$56,258	
Present value of FCFF		-\$595	-\$573	-\$496	-\$369	-\$200	\$7	\$248	\$520	\$822	\$1,152	
Present value of terminal value											\$22,914	
Cost of capital	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	9.60%	9.20%	8.80%	8.40%	8.00%	G1

PV of cash flows during next 10 years =	\$515	
PV of terminal value =	\$22,914	
Value of operating assets	\$23,429	
Probability of failure	0.00%	G2
Adjusted value of operating assets	\$23,429	
Less Debt	\$0	
Value of Equity	\$23,429	

Expense Profile	Operating Margin
E1: Independent contractor	40%
E2: Partial employee	25%
E3: Full employee	15%

Capital Intensity
F: Status Quo: Sales/Capital = 5

Competitive Advantages	Slice of Gross Receipts
D1. None	5%
D2. Weak	10%
D3. Semi-strong	15%
D4. Strong & Sustainable	20%

Risk Estimates

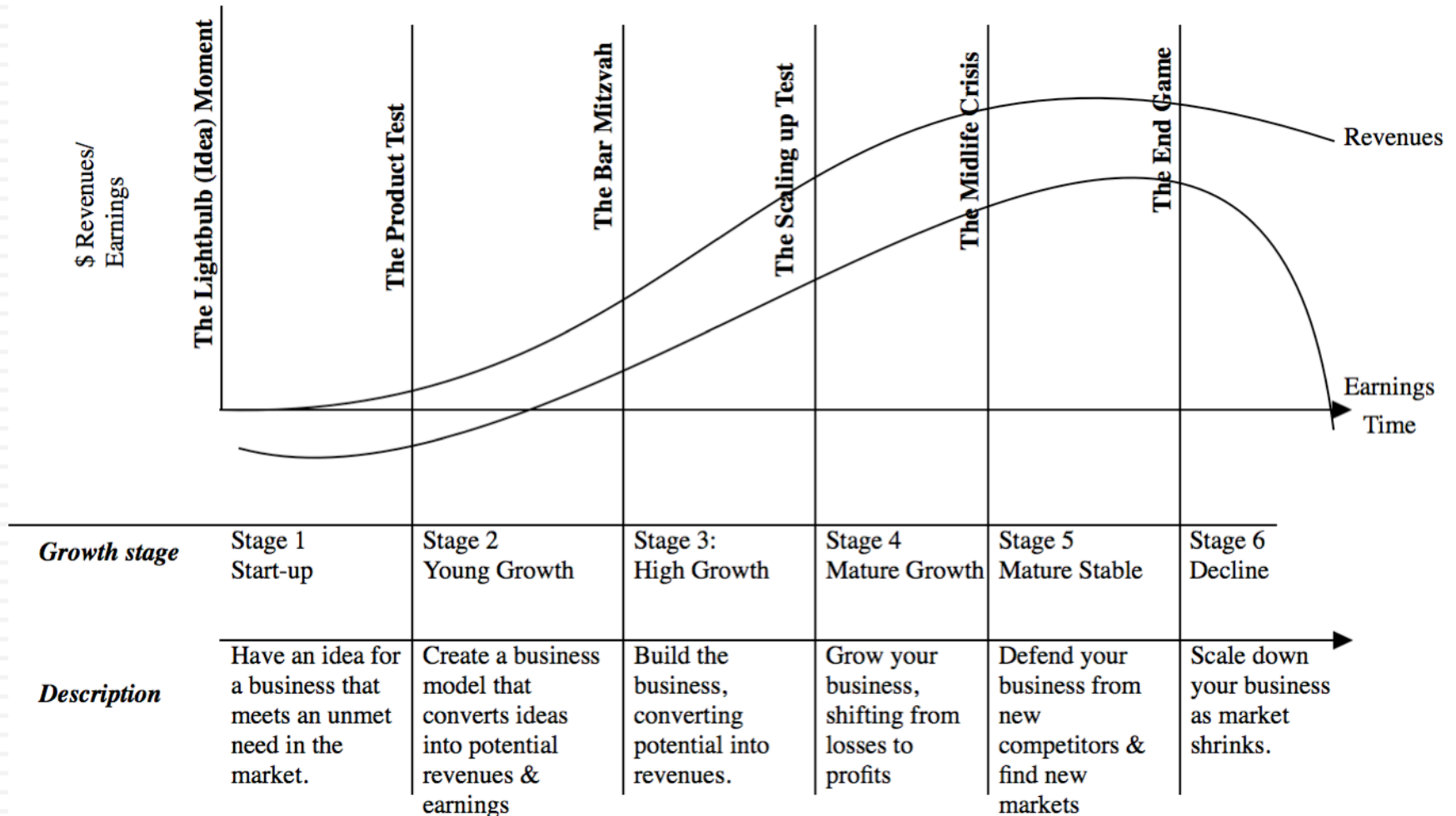
- G1. Cost of capital at 75th percentile of US companies = 10%
- G2. Probability of failure in next 10 years= 0%

Uber Valuation: September 2015

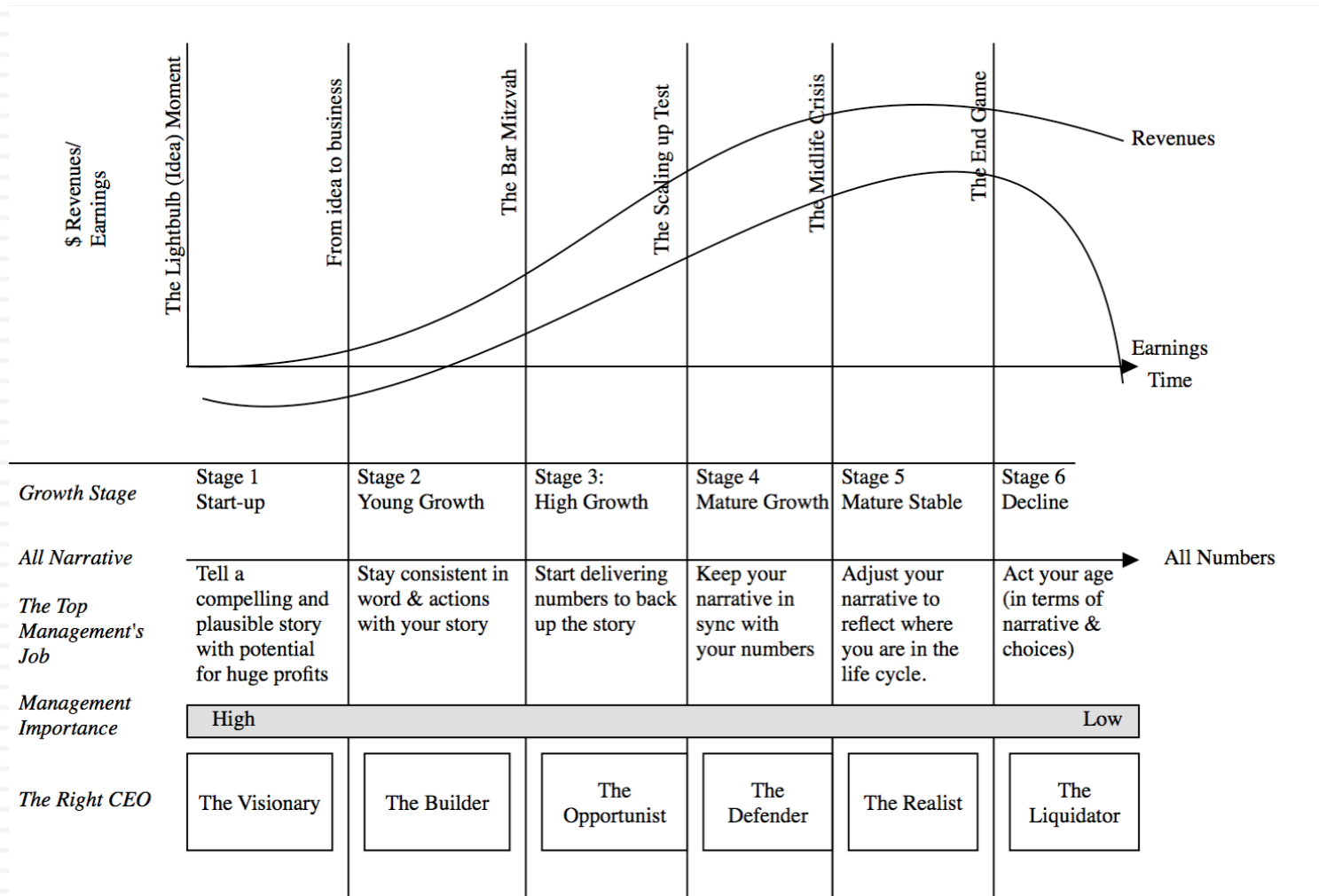
Investors and Managers: Narrative or Numbers?

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


Introducing the corporate life cycle



The Managerial Challenge



The Investor Challenge

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



The End

“There is no real ending. It’s just the place where you stop the story.”