NUMBERS AND NARRATIVE: MODELING, STORY TELLING AND INVESTING

Aswath Damodaran

Let’s start with an experiment

A valuation of Amazon in September 2018

A DCF valuation of Amazon

Amazon in September 2018					
The Assumptions					
	Base year	Years 1-5	Years 6-10		After year 10
Revenues (a)	$ 208,125	15.00%	3.00%		3.00%
Operating margin (b)	7.71%	7.71%	12.50%		12.50%
Tax rate	20.20%	20.20%	24.00%		24.00%
Reinvestment (c)		Sales to capital ratio	5.95	RIR =	30.00%
Return on capital	15.24%	Marginal ROIC =	89.16%		10.00%
Cost of capital (d)		7.97%	7.50%		7.50%
The Cash Flows					
	Revenues	Operating Margin	EBIT (1-t)	Reinvestment	FCFF
1	$ 239,344	8.67%	$ 16,560	$ 5,249	$ 11,311
2	$ 275,245	9.63%	$ 21,147	$ 6,037	$ 15,110
3	$ 316,532	10.59%	$ 26,736	$ 6,942	$ 19,794
4	$ 364,012	11.54%	$ 33,527	$ 7,983	$ 25,544
5	$ 418,614	12.50%	$ 41,754	$ 9,181	$ 32,573
6	$ 471,359	12.50%	$ 46,568	$ 8,869	$ 37,699
7	$ 519,438	12.50%	$ 50,825	$ 8,084	$ 42,741
8	$ 559,954	12.50%	$ 54,258	$ 6,813	$ 47,446
9	$ 590,191	12.50%	$ 56,628	$ 5,084	$ 51,544
10	$ 607,897	12.50%	$ 57,750	$ 2,977	$ 54,773
Terminal year	$ 626,134	12.50%	$ 59,483	$ 17,845	$ 41,638
The Value					
Terminal value		$ 925,287			
PV(Terminal value)		$ 435,438			
PV (CF over next 10 years)		$ 206,707			
Value of operating assets =		$ 642,144			
Adjustment for distress		$ -			
- Debt & Mnority Interests		$ 45,435			
+ Cash & Other Non-operating assets		$ 27,050			
Value of equity		$ 623,759			
- Value of equity options		$ -			
Number of shares		497.00			
Value per share		**$ 1,255.05**	Stock was trading at =		$1,970.19

A ‘narrative’ about Amazon: A Disruption Platform!

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), acting as a **disruption machine**, entering any business where is senses weakness in status quo
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?

Amazon	Sep-18

The Greatest (and most Feared) Disruptive Platform in History

Amazon will complete its metaphorsis from being a retail company to one that can take its competitive advantages - access to capital & willingness to lose money for long periods, while disrupting and changing the status quo - to any business that it targets, giving it the potential for high revenue growth on top of already-large revenues. It will be able to use the pricing power it accumulates in each business it is in, to increase profit margins, partly through economies of scale and partly through higher prices. Its low debt ratio and divergent business mix give it a low cost of capital.

The Assumptions

	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 208,125	15.00%	3.00%		3.00%	Expanding into new businessses
Operating margin (b)	7.71%	7.71%	12.50%		12.50%	Economies of scale and pricing power increase margins
Tax rate	20.20%	20.20%	24.00%		24.00%	Converging on a global tax rate of 25%
Reinvestment (c)		Sales to capital ratio	5.95	RIR =	30.00%	Big payoffs from investing in technology and content
Return on capital	15.24%	Marginal ROIC =	89.16%		10.00%	The last man standing...
Cost of capital (d)		7.97%	7.50%		7.50%	Low debt & diverse business mix

The Cash Flows

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Adjustment for distress	$ -	Probability of failure =	0.00%
- Debt & Mnority Interests	$ 45,435		
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Numbers person or Story teller?

Vive le difference!

What are you?

- If you were asked to categorize yourself, would you more naturally think of yourself as a
  a) Numbers Person
  b) Story Person
  c) Not sure
- When did you make this decision and how has it affected your educational and career choices?
- As you get older, do you find yourself becoming more of whatever you chose?

Dueling Perspectives

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

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

Favored Tools
- Accounting statements
- Excel spreadsheets
- Statistical Measures
- Pricing Data

Favored Tools
- Anecdotes
- Experience (own or others)
- Behavioral evidence

A Good Valuation

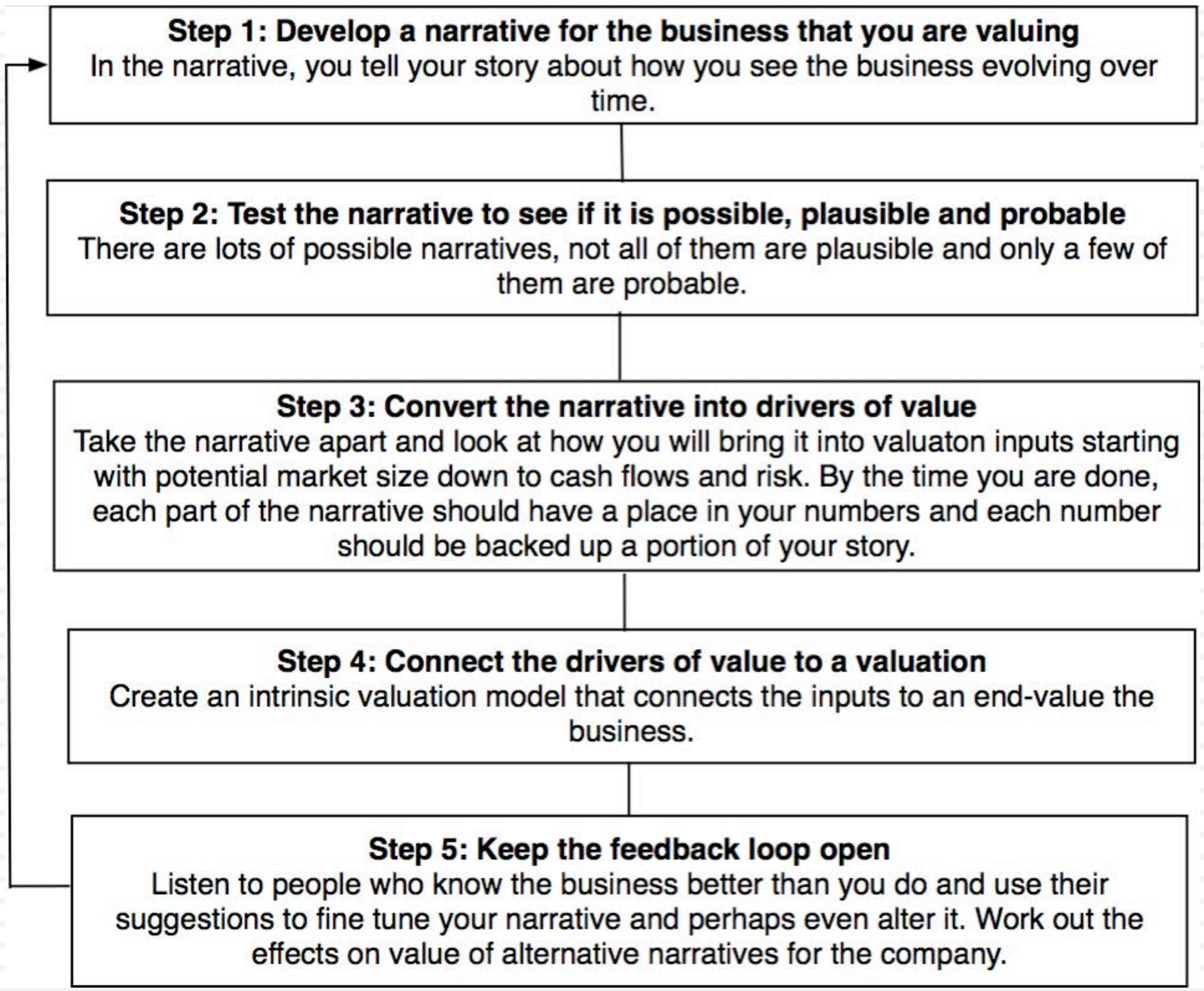
The Numbers People ⟷ The Narrative People

Illusions/Delusions
1. Precision: Data is precise
2. Objectivity: Data has no bias
3. Control: Data can control reality

Illusions/Delusions
1. Creativity cannot be quantified
2. If the story is good, the investment will be.
3. Experience is the best teacher

FROM NARRATIVE TO NUMBERS: THE MECHANICS

The Steps


Step 1: Develop a narrative for the business that you are valuing
In the narrative, you tell your story about how you see the business evolving over time.
Step 2: Test the narrative to see if it is possible, plausible and probable
There are lots of possible narratives, not all of them are plausible and only a few of them are probable.
Step 3: Convert the narrative into drivers of value
Take the narrative apart and look at how you will bring it into valuaton inputs starting with potential market size down to cash flows and risk. By the time you are done, each part of the narrative should have a place in your numbers and each number should be backed up a portion of your story.
Step 4: Connect the drivers of value to a valuation
Create an intrinsic valuation model that connects the inputs to an end-value the business.
Step 5: Keep the feedback loop open
Listen to people who know the business better than you do and use their suggestions to fine tune your narrative and perhaps even alter it. Work out the effects on value of alternative narratives for the company.

Step 1a: 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.

Understanding Uber in 2014

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

Understanding Ferrari in 2015

Low Growth + *It is in 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%

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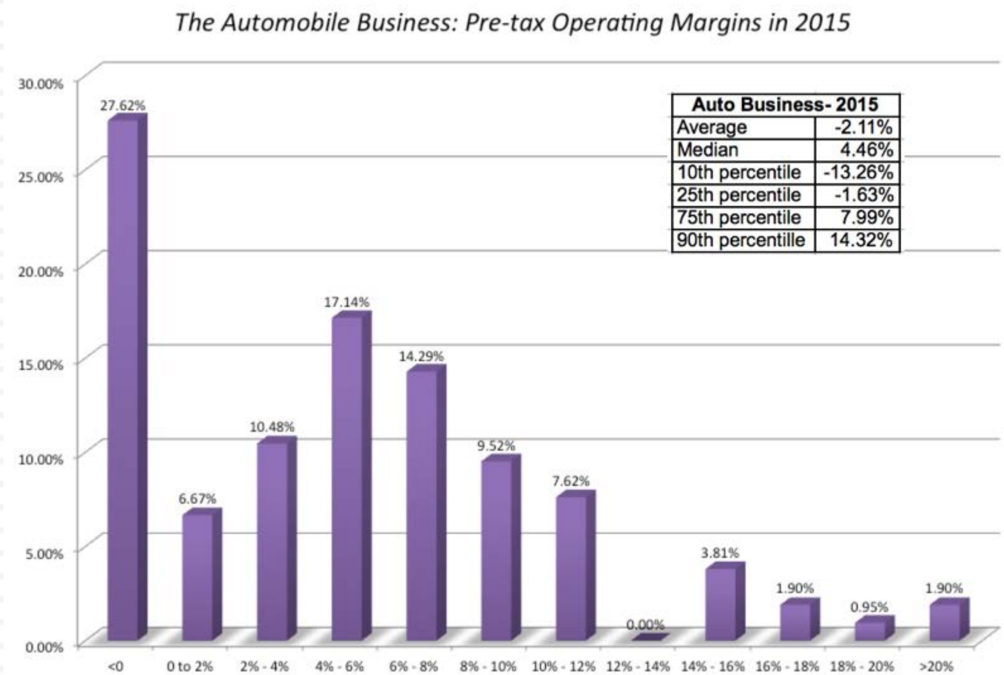
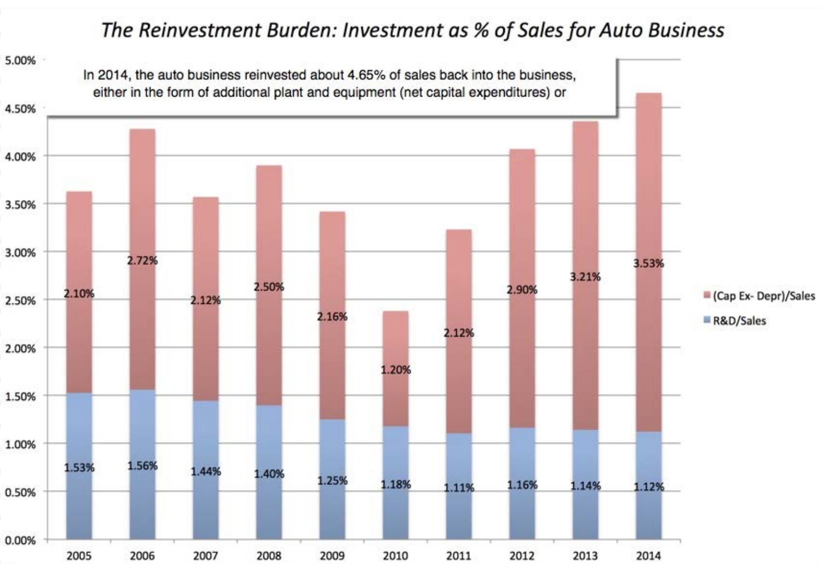


High & Increasing Reinvestment



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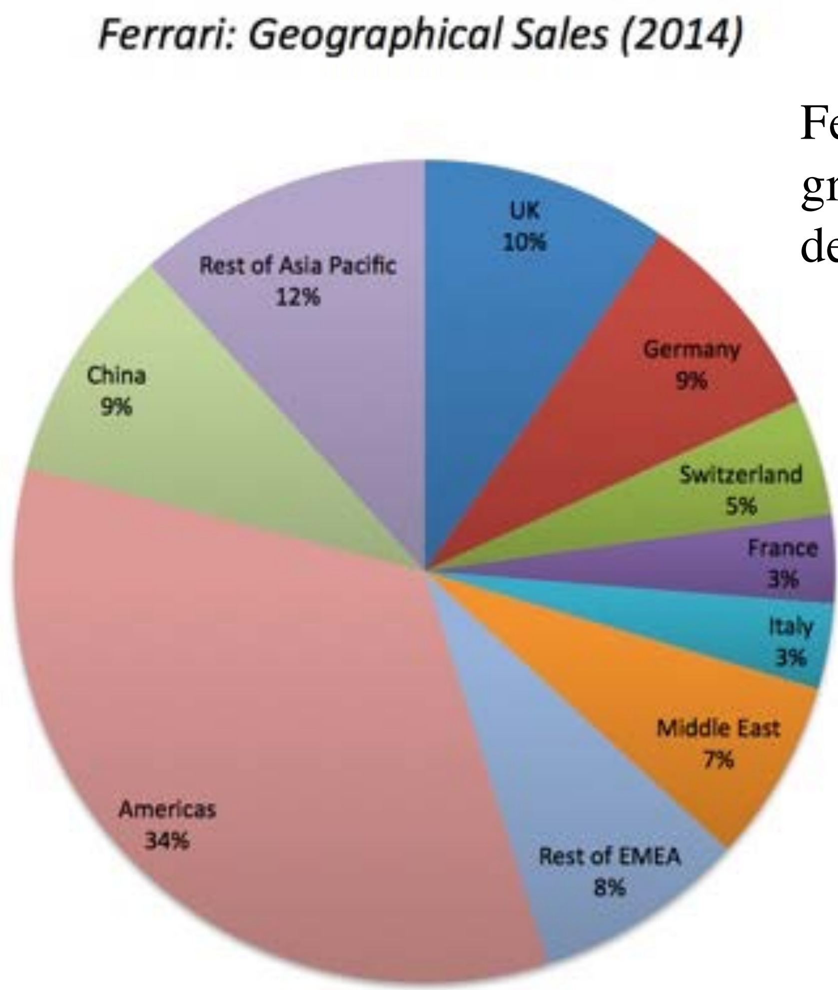
Bad Business

	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

But it is not just another auto company..

Ferrari sold only 7,255 cars in all of 2014



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

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 has not invested in new plants.

Step 1b: 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: An Urban, Car Service disruptor

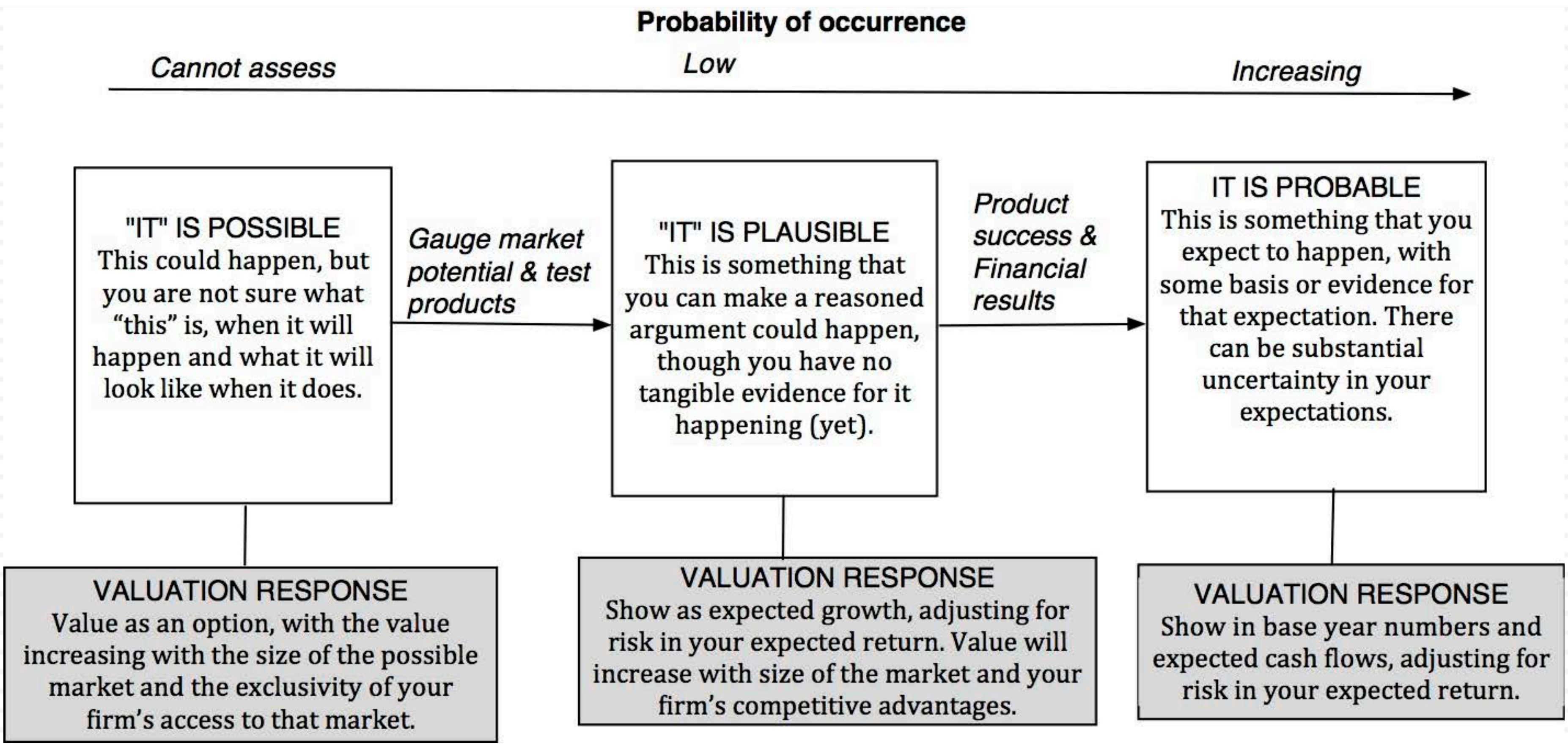
In June 2014, my initial narrative for Uber was that it would be

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.

The Ferrari Narrative: An Exclusive Club

- 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.

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



The Impossible, The Implausible and the Improbable

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 exceeds 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.

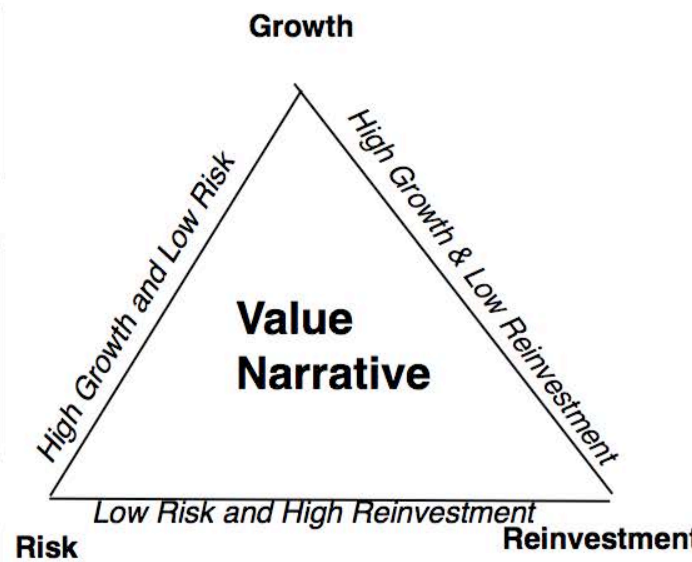
The Implausible

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



The Improbable: Willy Wonkitis

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

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Unit Volume	24,298	36,883	64,684	86,713	149,869	214,841	291,861	384,747	466,559	550,398	643,850	726,655	820,645	922,481	1,034,215	1,137,780
% Growth		52%	75%	34%	73%	43%	36%	32%	21%	18%	17%	13%	13%	12%	12%	10%
Automotive Revenue Per Unit ($)	93,403	85,342	83,432	78,932	65,465	58,258	56,407	55,553	55,991	56,586	56,969	57,540	58,138	58,603	59,002	59,554
% Growth		-9%	-2%	-5%	-17%	-11%	-3%	-2%	1%	1%	1%	1%	1%	1%	1%	1%
Automotive Sales	2,462	3,321	5,613	7,051	10,025	12,720	16,685	21,595	26,347	31,357	36,897	42,022	47,949	54,283	61,221	67,980
Development Service Sales	16	40	42	44	46	49	51	54	56	59	62	65	68	72	75	79
Total Sales	**2,478**	**3,361**	**5,655**	**7,095**	**10,072**	**12,768**	**16,736**	**21,648**	**26,403**	**31,416**	**36,959**	**42,087**	**48,017**	**54,355**	**61,296**	**68,059**
% Growth		36%	68%	25%	42%	27%	31%	29%	22%	19%	18%	14%	14%	13%	13%	11%
EBITDA	**148**	**417**	**920**	**1,042**	**1,586**	**2,150**	**3,138**	**4,066**	**4,857**	**5,723**	**6,328**	**7,182**	**8,144**	**9,688**	**10,874**	**12,099**
% Margin	6.0%	12.4%	16.3%	14.7%	15.7%	16.8%	18.7%	18.8%	18.4%	18.2%	17.1%	17.1%	17.0%	17.8%	17.7%	17.8%
D&A	103	158	172	203	301	353	389	537	606	696	811	938	1,088	1,260	1,451	1,661
% of Capex	41%	79%	55%	65%	62%	69%	78%	86%	79%	77%	75%	76%	76%	76%	76%	77%
EBIT	**45**	**259**	**748**	**839**	**1,285**	**1,796**	**2,749**	**3,529**	**4,252**	**5,027**	**5,517**	**6,244**	**7,056**	**8,429**	**9,423**	**10,439**
% Margin	1.8%	7.7%	13.2%	11.8%	12.8%	14.1%	16.4%	16.3%	16.1%	16.0%	14.9%	14.8%	14.7%	15.5%	15.4%	15.3%
Net Interest Income (Expense)	(27)	(1)	9	33	47	90	108	155	199	278	358	445	542	651	784	934
Other Income	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pretax Income	**46**	**258**	**758**	**872**	**1,332**	**1,886**	**2,857**	**3,684**	**4,451**	**5,305**	**5,875**	**6,688**	**7,598**	**9,080**	**10,207**	**11,373**
Income Taxes	3	2	14	34	86	262	462	641	807	1,003	1,134	1,317	1,470	1,761	2,028	2,323
% Effective Rate	6%	1%	2%	4%	6%	14%	16%	17%	18%	19%	19%	20%	19%	19%	20%	20%
Net Income	**44**	**256**	**744**	**839**	**1,246**	**1,624**	**2,395**	**3,043**	**3,644**	**4,303**	**4,741**	**5,372**	**6,128**	**7,319**	**8,179**	**9,050**
Plus																
After-tax Interest Expense (Income)	27	1	(9)	(33)	(47)	(90)	(108)	(154)	(199)	(278)	(357)	(444)	(541)	(650)	(782)	(932)
Depreciation of PP&E	103	158	172	203	301	353	389	537	606	696	811	938	1,088	1,260	1,451	1,661
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Less																
Change in Working Capital	(155)	(14)	(157)	(167)	(172)	(325)	(163)	(81)	(28)	(299)	(356)	(328)	(219)	(329)	(365)	(376)
% of Change in Sales		-2%	-7%	-12%	-6%	-12%	-4%	-2%	-1%	-6%	-6%	-6%	-4%	-5%	-5%	-6%
Capital Expenditures	250	200	312	312	486	510	497	623	765	906	1,078	1,236	1,437	1,660	1,898	2,149
% of Sales	10%	6%	6%	4%	5%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unlevered Free Cash Flow	**78**	**229**	**750**	**863**	**1,186**	**1,702**	**2,343**	**2,884**	**3,314**	**4,113**	**4,472**	**4,959**	**5,456**	**6,597**	**7,315**	**8,005**

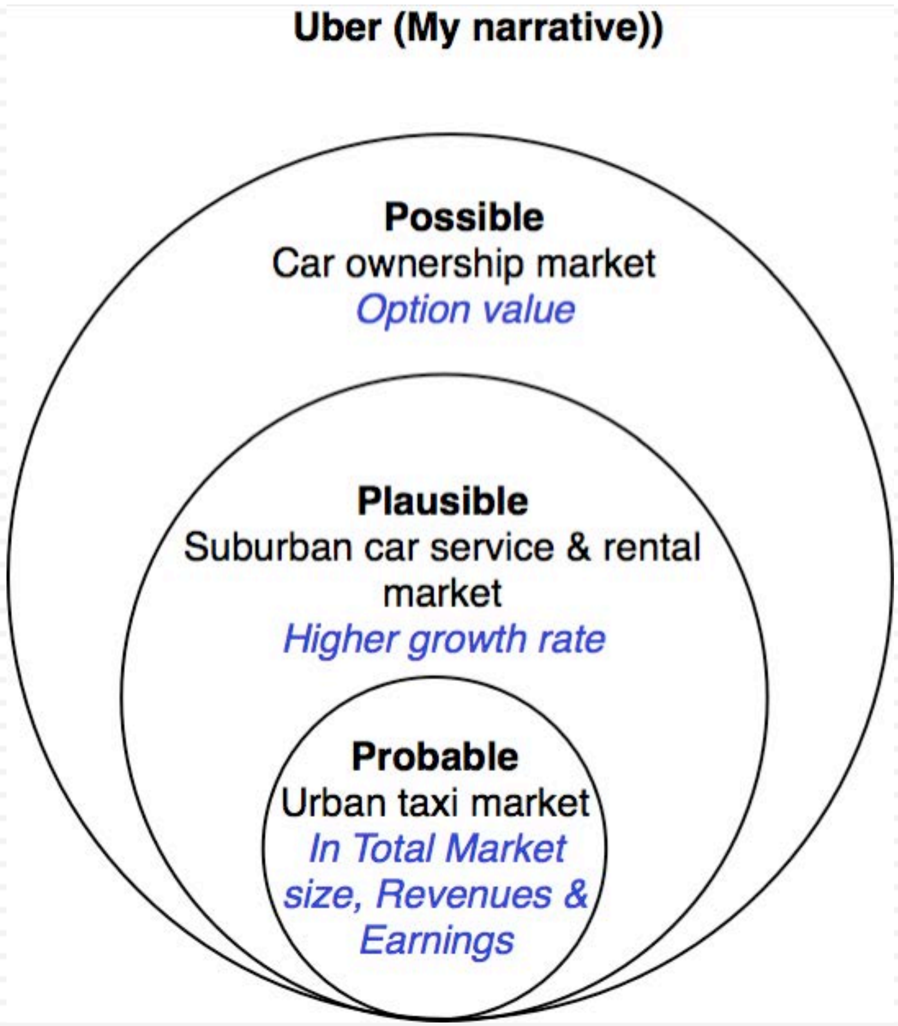
EBITDA	12,099
Sales	68,059
Net Debt (Cash)	(260)
Tesla Diluted Shares	142

Exit EBITDA High	12.0 x	Exit PPG High	5.0%	Exit P/Sales High	180%
Exit EBITDA Low	8.0 x	Exit PPG Low	3.0%	Exit P/Sales Low	130%

Discount Rate High	13.0%	FY Month of Valuation	1.0 (Beginning of this Month)
Discount Rage Low	9.0%	Month of FY End	12.0 (End of this Month)

Uber: Possible, Plausible and Probable

The larger & more ambitious your story, the more onus there is on you to show that it is possible, plausible & probable.



Big Story or Small One?

- The upside of a big story is that it will generally deliver a higher value for your company, if you can get others to believe it is plausible and probable.
- The downside is two fold:
  - Your sales job becomes a lot more difficult, as your story gets bigger. In fact, there is a danger that you could be categorized as a fairy tale teller, if your story is too big.
  - Even if you succeed in convincing others that the story is plausible and probable, you will now have to act and deliver on that big story. That can stretch resources to breaking point and distract you from building your primary business.

The Runaway Story: When you want a story to be true…

- With a runaway business story, you usually have three ingredients:
  1. Charismatic, likeable Narrator: The narrator of the business story is someone that you want to see succeed, either because you like the narrator or because he/she will be a good role model.
  2. Telling a story about disrupting a much business, where you dislike the status quo: The status quo in the business that the story is disrupting is dissatisfying (to everyone involved)>
  3. With a societal benefit as bonus: And if the story holds, society and humanity will benefit.
- Since you want this story to work out, you stop asking questions, because the answers may put the story at risk.

The Impossible: The Runaway Story

The Story

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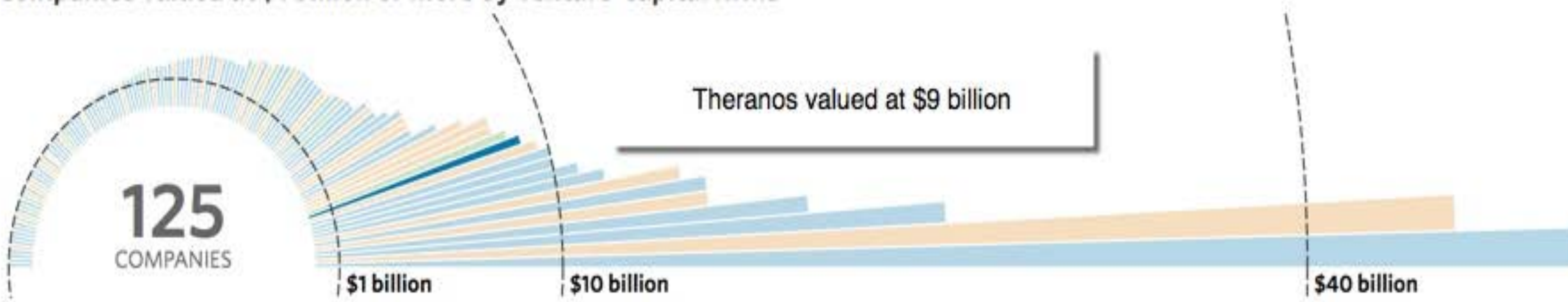
The Checks (?)

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

\+ Money

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



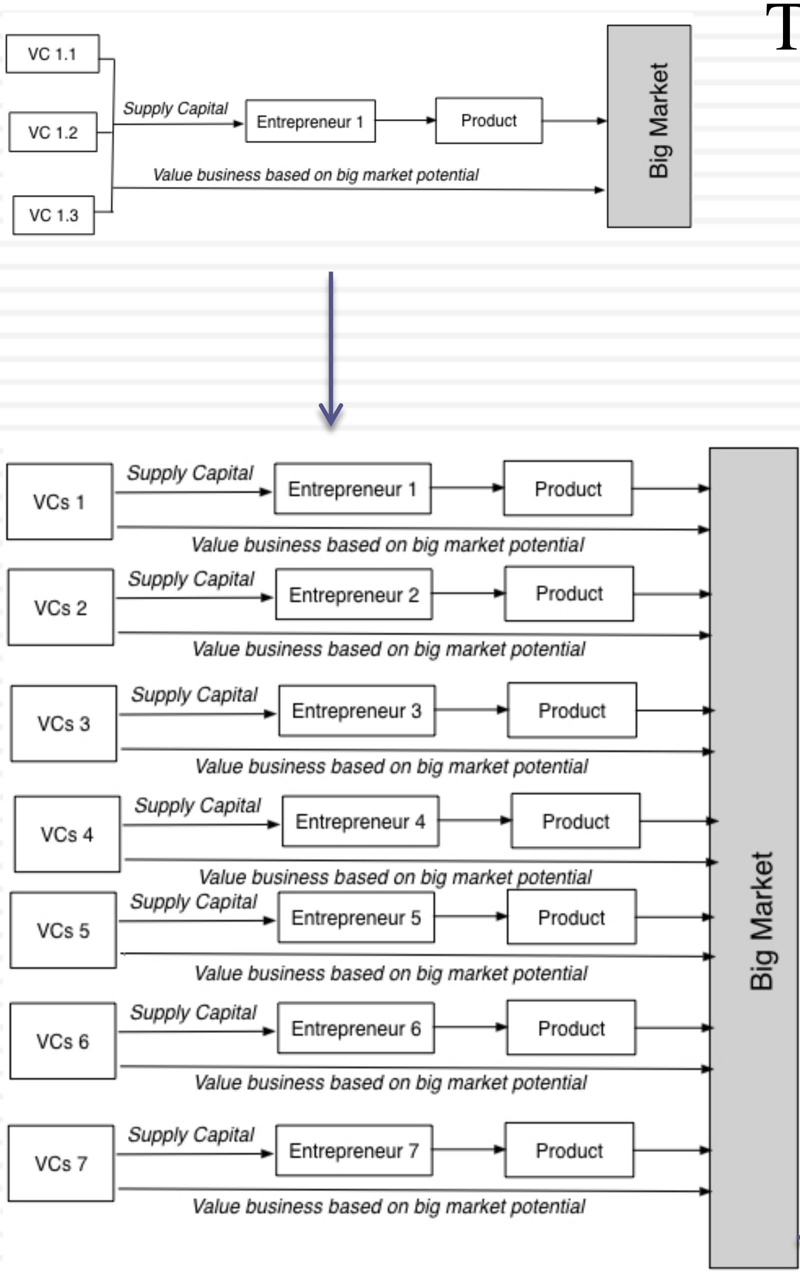
Valuations as of **October 2015**

Select companies from the chart or table for more detail.

The root of implausible and improbable stories: Over confidence!

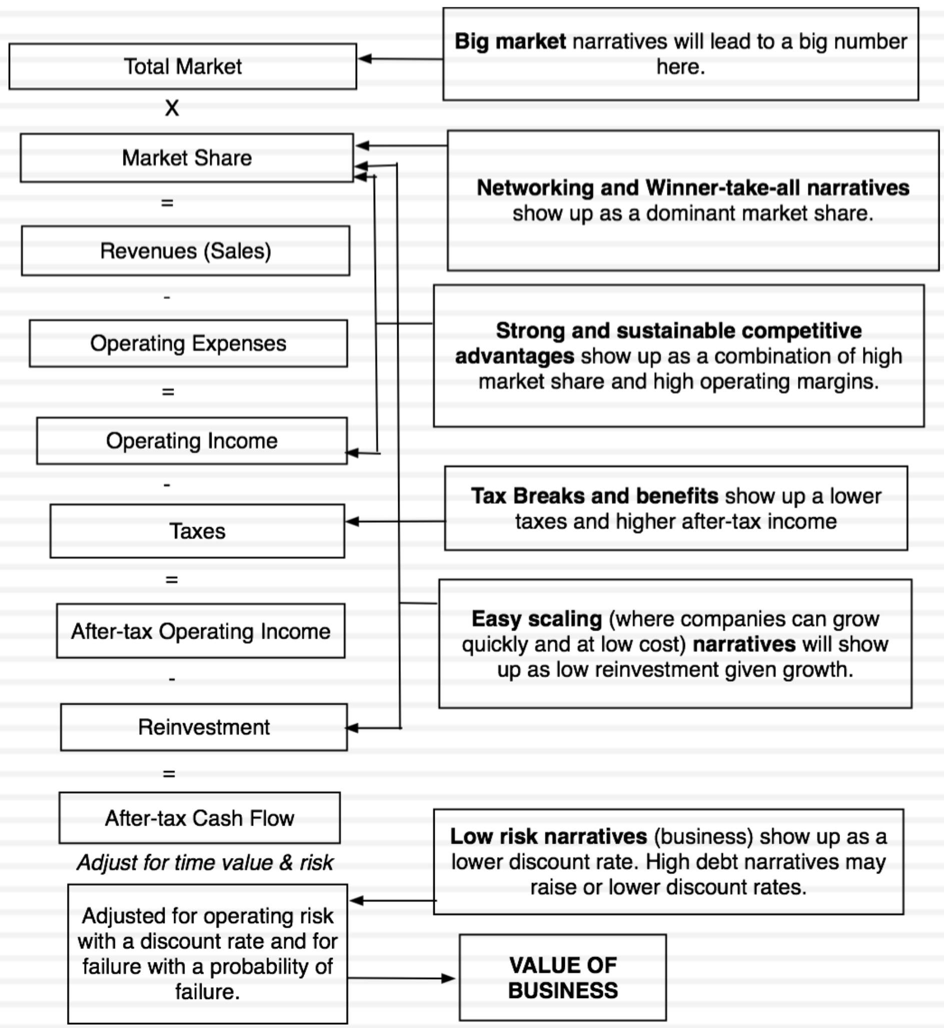
- In the last three decades of research on behavioral finance, researchers have uncovered the not so surprising truth that as human beings, we are not only capable of thinking irrationally, but hard wired to do so.
- Of all of the character attributes that human beings have, the one that seems to create the most consequential errors is over confidence.
- Over confident founders, with over confident investors providing them capital, shoot for big markets, often fail but change the way we live in significant ways.

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

The Uber narrative (June 2014)

Total Market

X

Market Share

=

Revenues (Sales)

-

Operating Expenses

=

Operating Income

-

Taxes

=

After-tax Operating Income

-

Reinvestment

=

After-tax Cash Flow

Adjust for time value & risk

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

Uber is an **urban car service company,** competing against taxis & limos in urban areas, but it may expand demand for car service. **The global taxi/limo business is $100 billion in 2013, growing at 6% a year.**

Uber will have competitive advantages against traditional car companies & against newcomers in this business, but no global networking benefits. ***Target market share is 10%***

Uber will maintain its current model of keeping 20% of car service payments, even in the face of competition, because of its first mover advantages. It will maintain its current low-infrastructure cost model, allowing it to earn high margins. **Target pre-tax operating margin is 40%.**

Uber has a low capital intensity model, since it does not own cars or other infrastructure, allowing it to maintain a high **sales to capital ratio for the sector (5.00)**

The company is young and still trying to establish a business model, leading to a **high cost of capital (12%)** up front. As it grows, it will become safer and its cost of capital will drop to 8%.

VALUE OF OPERATING ASSETS

Cash

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

Ferrari: From story to numbers

Valuation Input	*The Story*	*Valuation Inputs*
Revenues	*Keep it scarce*	Revenue growth of 4% (in Euro terms) a year for next 5 years, scaling down to 0.7% in year 10. Translates into an increase in production of about 25% in next 10 years
Operating Margin & Taxes		
Operating Income	*And pricey*	Ferrari's pre-tax operating margin stays at 18.2%, in the 95th percentile of auto business.
Reinvestment	*Little need for capacity expansion*	Sales/Invested Capital stays at 1.42, i.e. every euro invested generates 1.42 euros in sales
Cash Flow		
Discount Rate (Risk)	*Super-rich clients are recession-proof*	Cost of capital of 6.96% in Euros and no chance of default.

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 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.

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

Value of operating assets = $6,595

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

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

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

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.

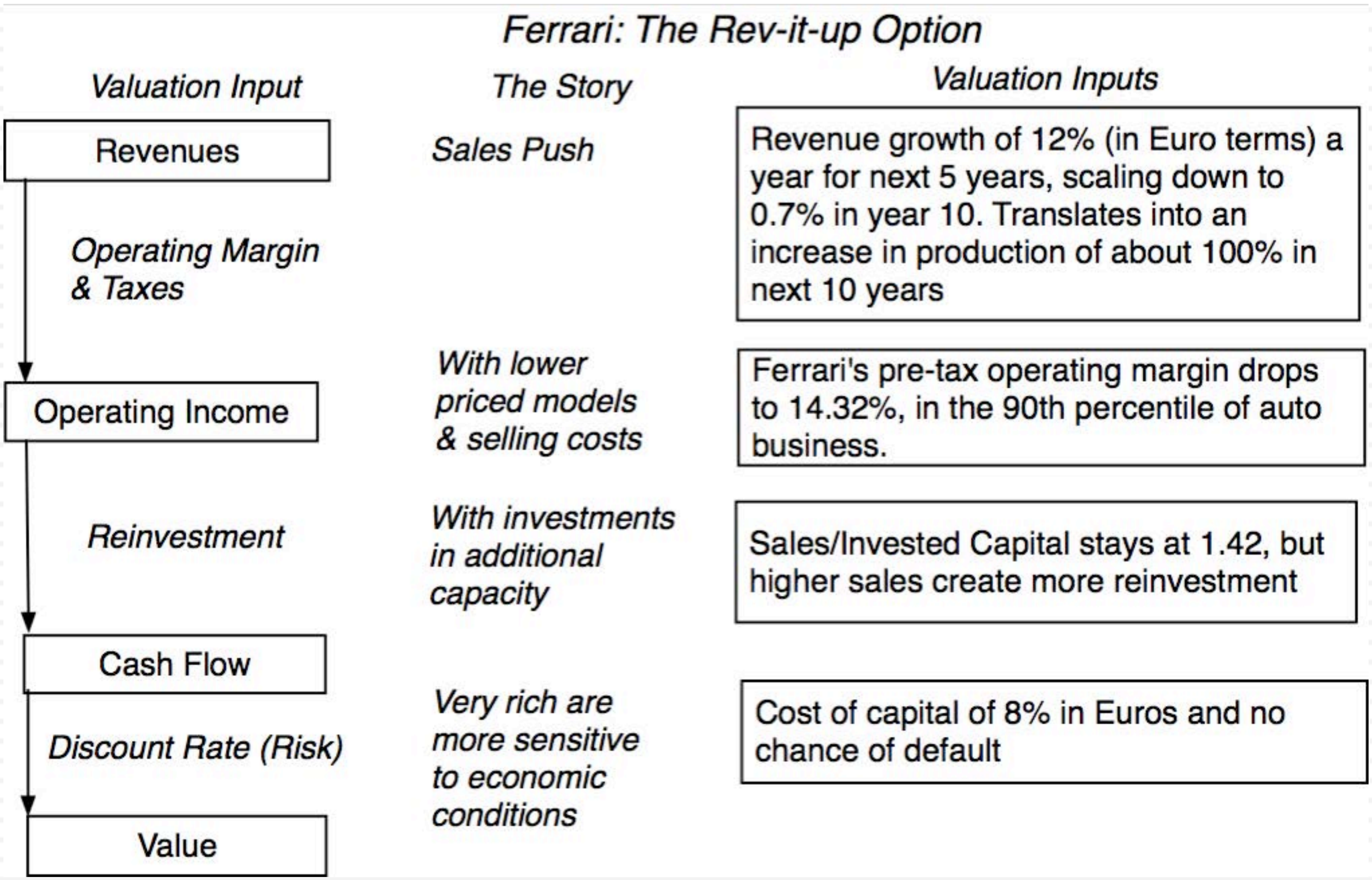
Valuing Bill Gurley's Uber narrative

	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)

Different narratives, Different Numbers

Total Market	*Growth Effect*	*Network Effect*	*Competitive Advantages*	*Value of Uber*
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

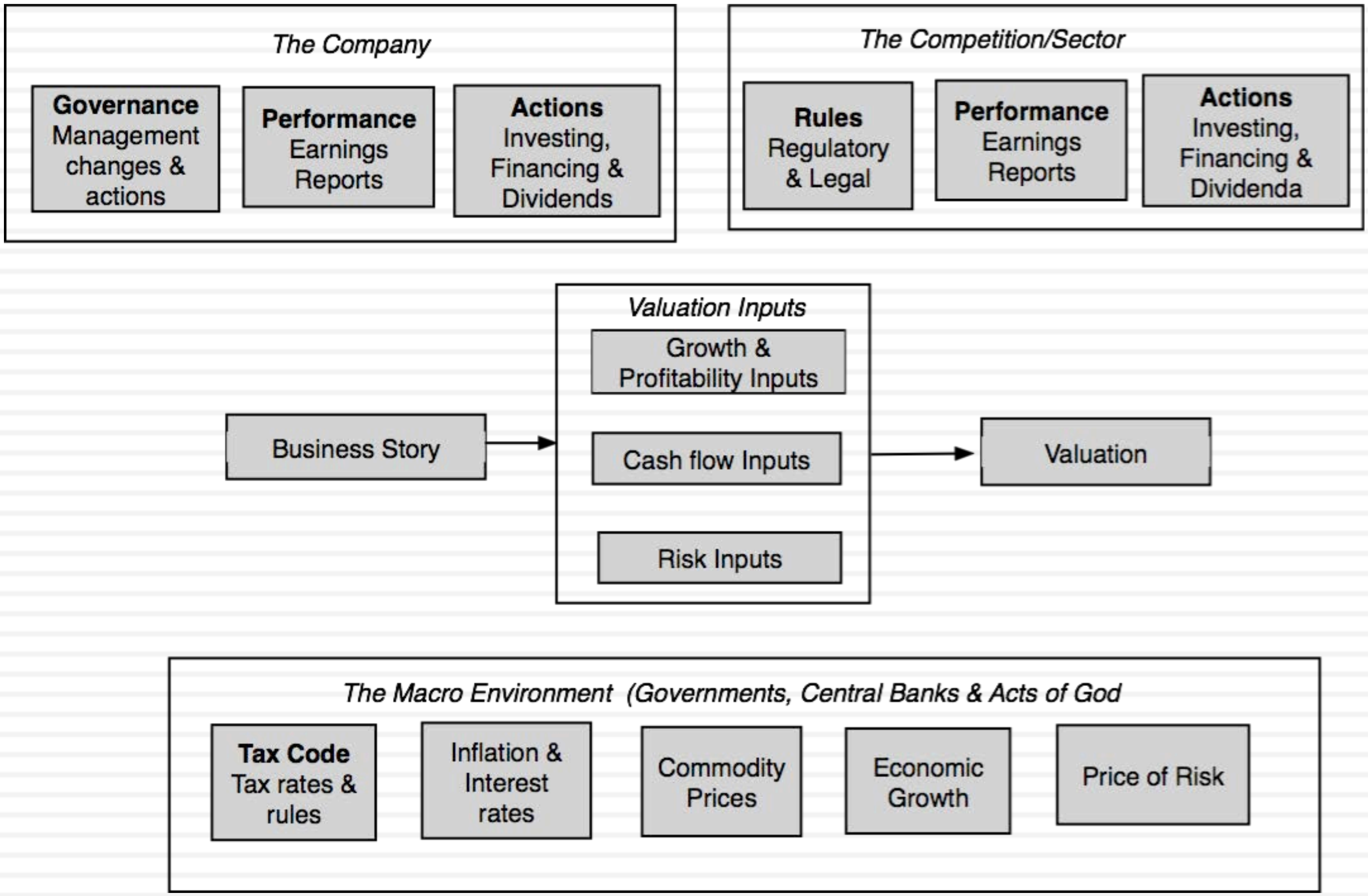
And the world is full of feedback.. My Ferrari afterthought!

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

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

The computer business is shrinking, with revenues dropping 9.4% over last year

The smartphone & tablet business continues to grow, albeit at lower rate, but margins are dropping faster than expected.

The retail business is growing but feeds off Apple's products

No mention of new products, suggesting that all will be quiet for near term.

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

Door opened for the issue of bonds ($50 billion?) to fund buybacks & dividends

The cash returned to stockholders will be predominantly in the form of buybacks, with a small dividend increase accompanying it.

Guidance for future quarters is conservative, at lower end of expectations.

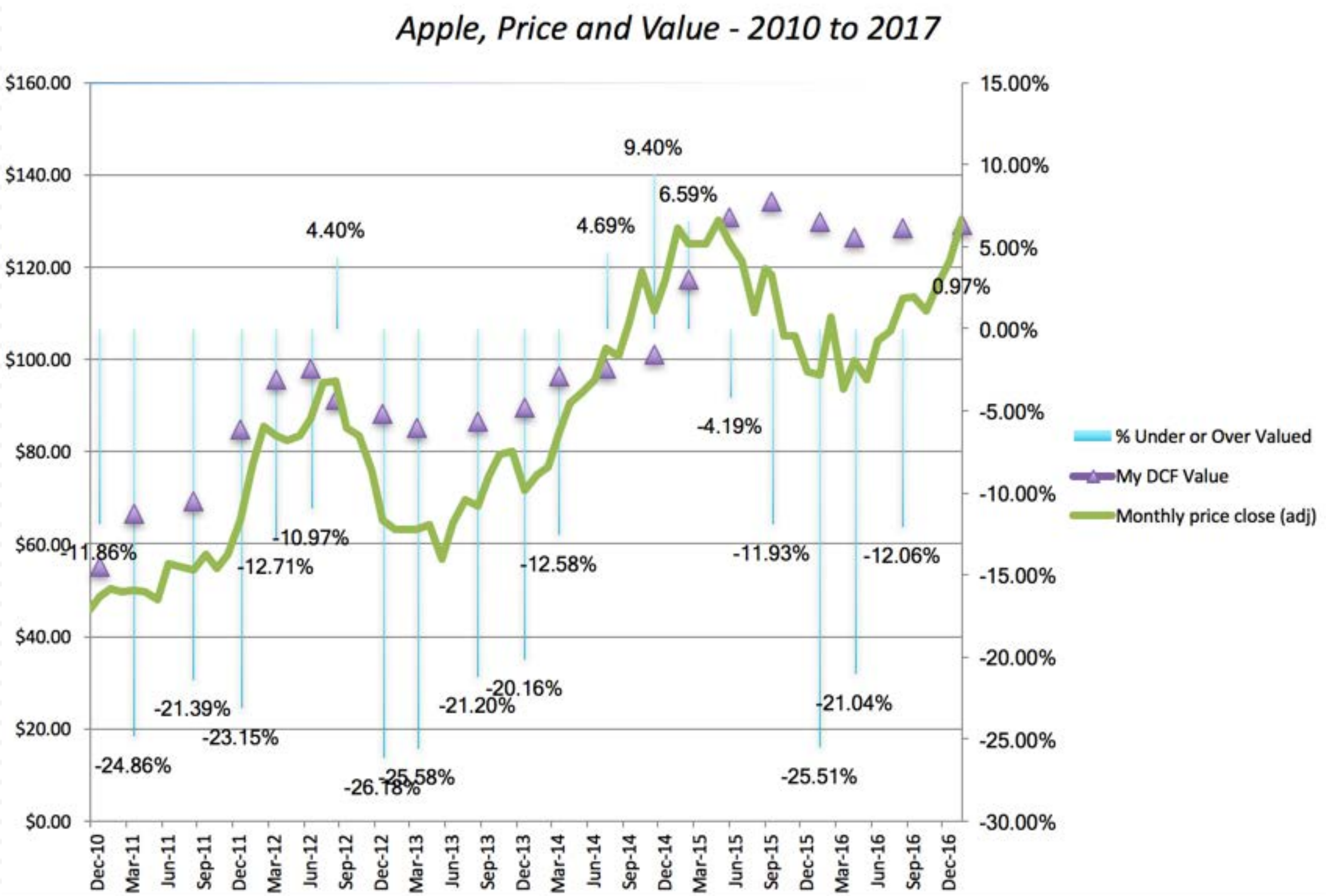
Apple continues to be a cash machine but will be returning $100 billion to its stockholders in the next two years

Bad news

Neutral or no news

Good news

Sometimes your story does not change..



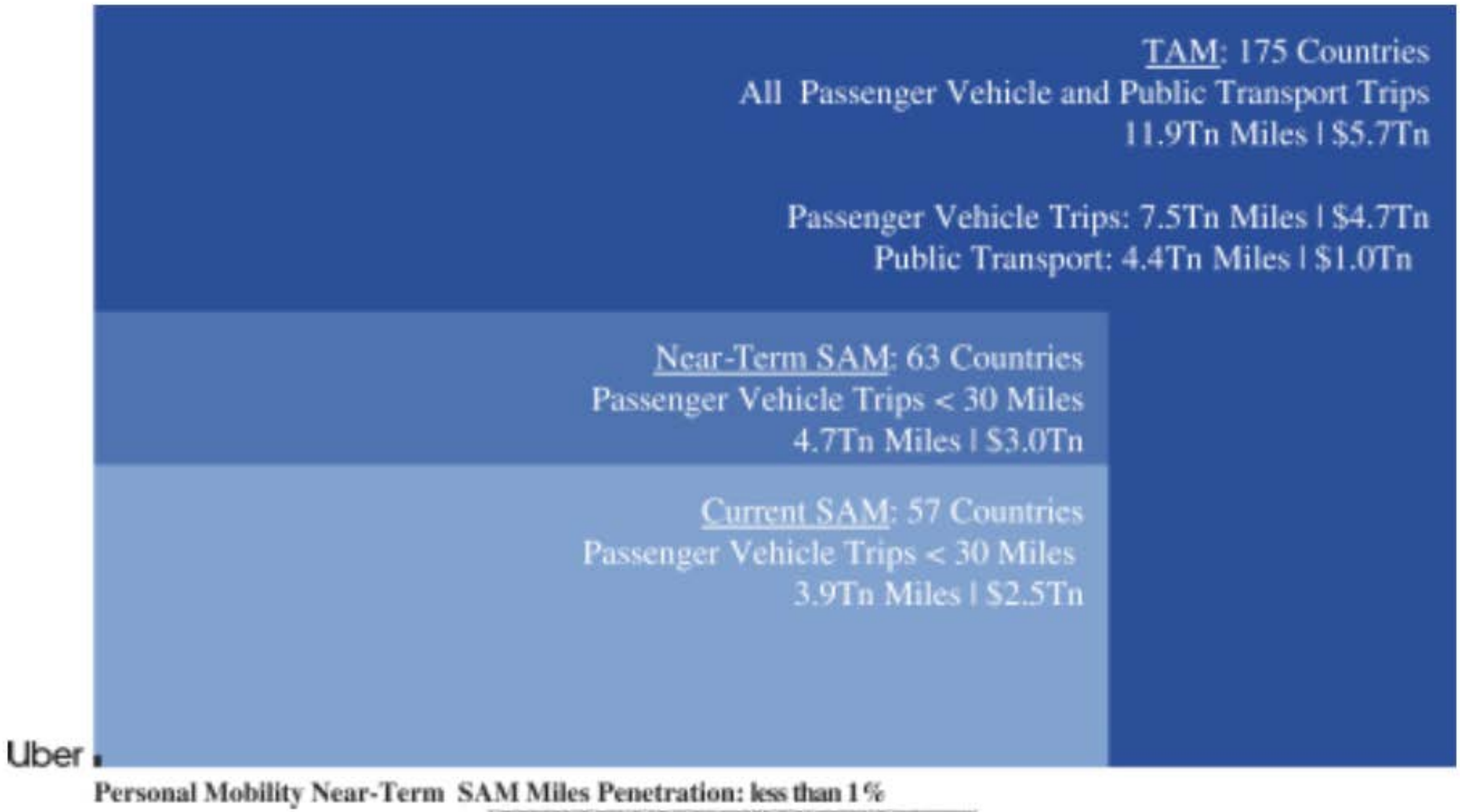
And sometimes it does.. Facebook's Evolution

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

The Prospectus

- It’s big and dense: To get a sense of where Uber stands now, just ahead of its IPO, I started with the prospectus, which weighing in at 285 pages, not counting appendices, and filled with pages of details, can be daunting.
- Disclosure’s dark side: It is a testimonial to how information disclosure requirements have had the perverse consequence of making the disclosures useless, by drowning investors in data and meaningless legalese.
  - I know that there are many who have latched on to the statement that "we may not achieve profitability" that Uber makes in the prospectus (on page 27) as an indication of its worthlessness, but I view it more as evidence that lawyers should never be allowed to write about investing risk.

The Business Spin! Personal Mobility? Really?



Uber

Uber: Personal Mobility Player?

Uber is primarily a ride sharing company, with ambtions of being a global logistics player. Its revenue growth has been astonishing, though it is starting to slow, but it remains a big money loser, as it searches for a business model that delivers more stickiness. In this story, Uber uses a combination of economies of scale and a more capital intensive business model to create a pathway to profitability. Along the way, it will become a less risky company, though its losses leave it exposed to a 5% chance of failure.

The Assumptions

	Base year	Years 1-5	Years 6-10	After year 10	Story link
Total Market	$400,000	Grow 10.39% a year		Grows 2.75% a year	Global logistics
Gross Market Share	12.45%	6.71%>30%		30%	Global Network benefits
Revenue Share	20.13%	Unchanged		20.13%	Market dominance keeps billing share high.
Operating Margin	-24.39%	-24.39% ->20%		15.00%	Full employee & more regulations
Reinvestment	NA	Sales to capital ratio of 4.00		Reinvestment rate = 7.5%	Low capital investment model
Cost of capital	NA	9.97%	9,97%->8.24%	8.24%	At 75th percentile of US firms
Risk of failure	5% chance of failure, if pricing meltdown leads to capital being cut off				Cash on hand + Capital access

The Cash Flows

	Total Market	Market Share	Revenues	EBIT (1-t)	Reinvestment	FCFF
1	$ 441,560	14.20%	$ 12,627	$ (2,369)	$ 650	$ (3,019)
2	$ 487,438	15.96%	$ 15,661	$ (2,057)	$ 759	$ (2,816)
3	$ 538,083	17.71%	$ 19,189	$ (1,441)	$ 882	$ (2,323)
4	$ 593,990	19.47%	$ 23,281	$ (438)	$ 1,023	$ (1,461)
5	$ 655,705	21.22%	$ 28,017	$ 1,050	$ 1,184	$ (134)
6	$ 723,833	22.98%	$ 33,485	$ 3,139	$ 1,367	$ 1,771
7	$ 799,039	24.73%	$ 39,787	$ 5,292	$ 1,576	$ 3,716
8	$ 882,059	26.49%	$ 47,037	$ 5,292	$ 1,813	$ 3,479
9	$ 973,705	28.24%	$ 55,365	$ 6,229	$ 2,082	$ 4,147
10	$1,074,873	30.00%	$ 64,915	$ 7,303	$ 2,387	$ 4,915
Terminal year	$1,101,745	30.00%	$ 66,537	$ 7,485	$ 936	$ 6,550

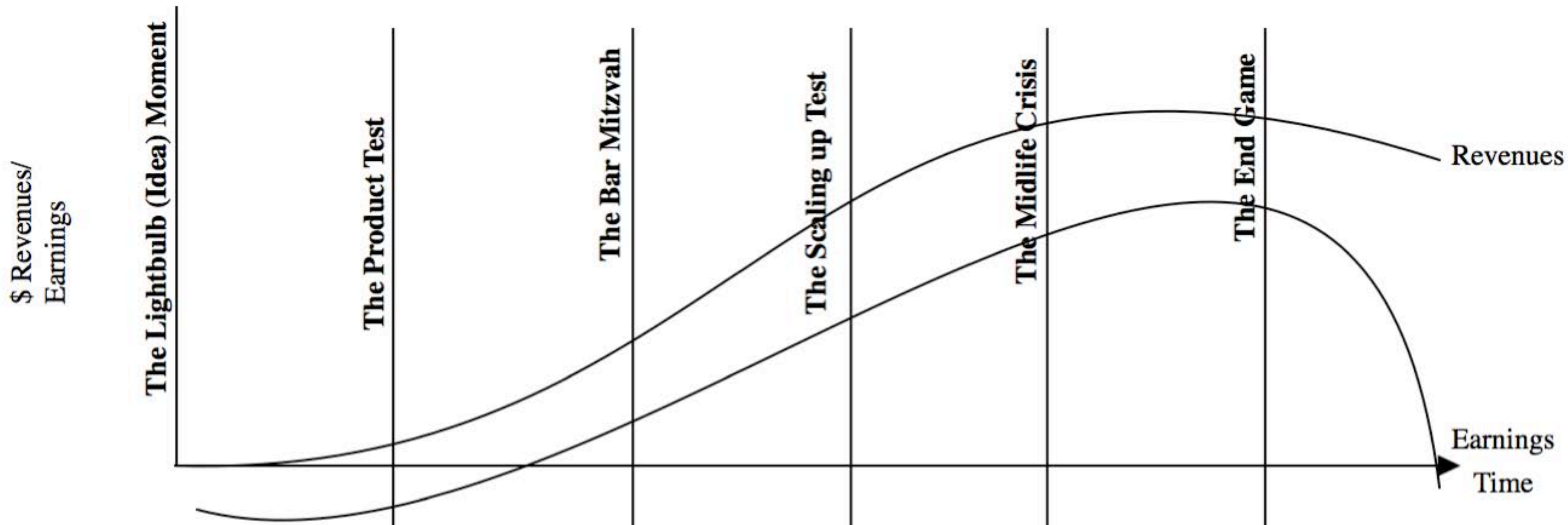
The Value

Terminal value	$ 114,108
PV(Terminal value)	$ 46,258
PV (CF over next 10 years)	$ 501
Value of operating assets =	$ 46,759
Probability of failure	5%
Value in case of failure	$ -
Adjusted Value for operating assets	$ 44,421
+ Cash on hand	$ 6,406
+ Cross holdings	$ 8,700
+ IPO Proceeds	$ 9,000
- Debt	$ 6,869
Value of equity	$ 61,658
Value per share	$ 32.91

Managers: Narrative or Numbers?

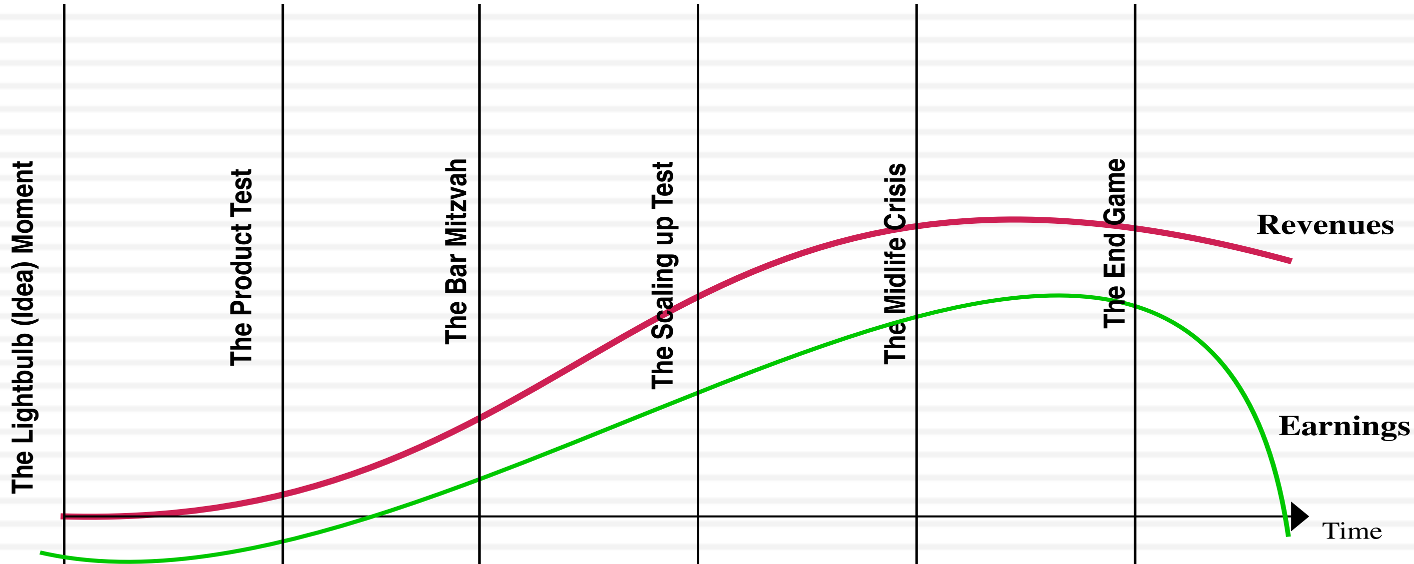
"Management is, above all, a practice where art, science, and craft meet"

Introducing the corporate life cycle



Growth stage	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
Description	Have an idea for a business that meets an unmet need in the market.	Create a business model that converts ideas into potential revenues & earnings	Build the business, converting potential into revenues.	Grow your business, shifting from losses to profits	Defend your business from new competitors & find new markets	Scale down your business as market shrinks.

Connecting to narratives..



Lifecycle stage	**Start-up**	**Young Growth**	**High Growth**	**Mature Growth**	**Mature Stable**	**Decline**
Narrative versus Numbers	All Narrative	Mostly narrative	Narrative + Numbers	Numbers + Narrative	Mostly Numbers	All Numbers
Narrative Drivers	How big is the narrative?	How plausible is narrative?	How profitable is narrative?	How scalable is narrative?	How sustainable is narrative?	How happy is the ending?
Narrative Differences	Unconstrained & Large differences	*Constraints mount as numbers build up* *Differences across investors narrow, as history deepens*				Constrained & Narrow differences

As companies age, the managerial imperative shifts..

- With young companies, you need dreamers & visionaries: 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, you need pragmatists and builders: 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 can work with and around those numbers.

Some companies (usually young ones) are story stocks..

Young company	+	Big Market	+	Narrator	=	Story Stock
Value comes moslty from growth potential & possilbilities		Going after a large market, aiming to be a big player		Founder or CEO is a master storyteller		

Tesla (July 2016)						
The Story						
Tesla is an auto/tech company looking towards the mass market. Its primary competitive advantages lies in superior technology & brand loyalty with a secondary advantage in styling. In terms of investment needs and risk, it is as much tech as auto company.						
The Assumptions						
	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 4,253	50.00%	25%->2.2%		1.47%	Mass market focus = $80 billion in revenue
Operating margin (b)	-14.15%	-14.15%	12.00%		12.00%	Tech superiority & brand = High margins
Tax rate	30.00%	30.00%	30.00%		30.00%	Global marginal tax rate average
Reinvestment (c)		Sales to capital ratio =	2.24	RIR =	16.33%	Invest like an auto/tech company
Return on capital	-13.25%	Marginal ROIC =	30.14%		9.00%	In maturity,, has tech features
Cost of capital (d)		8.13%	7.50%		7.50%	50% auto, 50% technology

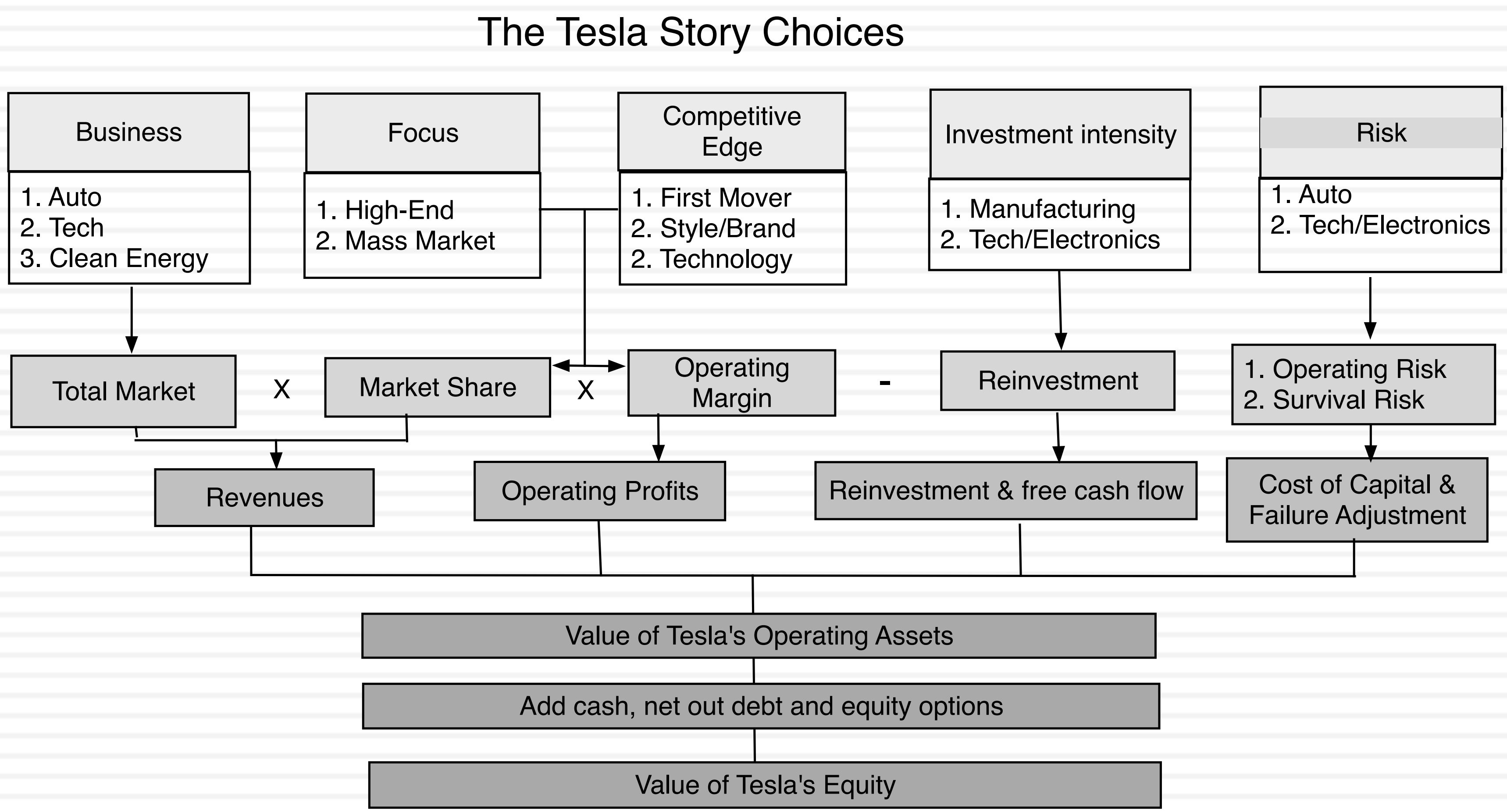
The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 6,380	-11.54%	$ (736)	$ (736)	$ 949	$ (1,685)
2	$ 9,570	-8.92%	$ (854)	$ (854)	$ 1,424	$ (2,278)
3	$ 14,355	-6.31%	$ (905)	$ (905)	$ 2,136	$ (3,041)
4	$ 21,532	-3.69%	$ (795)	$ (795)	$ 3,204	$ (3,999)
5	$ 32,298	-1.08%	$ (347)	$ (347)	$ 4,806	$ (5,154)
6	$ 45,312	1.54%	$ 698	$ 698	$ 5,810	$ (5,112)
7	$ 59,172	4.15%	$ 2,458	$ 2,458	$ 6,187	$ (3,729)
8	$ 71,528	6.77%	$ 4,842	$ 3,636	$ 5,516	$ (1,880)
9	$ 79,522	9.38%	$ 7,463	$ 5,224	$ 3,569	$ 1,655
10	$ 80,691	12.00%	$ 9,683	$ 6,778	$ 522	$ 6,256
Terminal year	$ 81,877	12.00%	$ 9,825	$ 6,878	$ 1,123	$ 5,754

The Value

Terminal value	$ 95,428		
PV(Terminal value)	$ 44,454		
PV (CF over next 10 years)	$ (14,963)		
Value of operating assets =	$ 29,491		
Adjustment for distress	$ 1,475	Probability of failure =	10.00%
- Debt & Mnority Interests	$ 3,648		
+ Cash & Other Non-operating assets	$ 1,442		
Value of equity	$ 25,810		
- Value of equity options	$ 3,446		
Number of shares	147.28		
Value per share	$ 151.85	Stock was trading at =	$221.00

Tesla is an example… Plausible story choices in 2016



And differing valuations..

Higher Revenues

High End → Mass Market

Auto

Less sales per $ invested (More reinvestment)

Tech

		Revenue in 2026 (in billions) with 9% margin				
		$ 60	$ 70	$ 80	$ 90	$ 100
Sales/Capital	1.19 (Auto)	$ (60.34)	$ (63.30)	$ (66.29)	$ (68.74)	$ (71.16)
	1.58 (Current)	$ (12.34)	$ (7.28)	$ (1.50)	$ 3.78	$ 9.47
	2.24 (Tech)	$ 30.81	$ 43.08	$ 56.75	$ 68.99	$ 81.97
		Revenue in 2026 (in billions) with 12% margin				
		$ 60	$ 70	$ 80	$ 90	$ 100
Sales/Capital	1.19 (Auto)	$ 11.25	$ 19.51	$ 28.81	$ 37.22	$ 46.22
	1.58 (Current)	$ 59.25	$ 75.53	$ 93.60	$ 109.75	$ 126.85
	2.24 (Tech)	$ 102.40	$ 125.89	$ 151.85	$ 174.96	$ 199.35
		Revenue in 2026 (in billions) with 15% margin				
		$ 60	$ 70	$ 80	$ 90	$ 100
Sales/Capital	1.19 (Auto)	$ 82.66	$ 102.11	$ 123.68	$ 142.95	$ 163.33
	1.58 (Current)	$ 130.65	$ 158.13	$ 188.47	$ 215.48	$ 243.97
	2.24 (Tech)	$ 173.80	$ 208.49	$ 246.72	$ 280.68	$ 316.46

My base case

Weaker competitive advantages

Higher profit margins

Stronger competitive advantages

Tesla						Jun-19

A Teenage Phenom faces growing (up) pains!

Tesla will grow as a high-end auto company, deilivering $100 billion in revenues in year 10. In the face of stronger competition, Tesla's brand name and batter technology will allow it to deliver on profitability (with margins in the 75th percentile of auto firms) and raise enough capital to cover its large reinvestment needs for much of the next decade. While Tesla's operating risk will move towards average over time, its debt burden puts it at risk of default, and that risk has risen to 20%. There is a floor to operating value at $35-$40 billion, at which the firm will be attractive as an acqusition target to an auto or (more likely) a large tech firm. Overlying all of this is the danger that Elon Musk will put the company's potential at risk, by either over reaching on product offerings or committing financial malpractice.

The Assumptions

	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 22,594	30.00%	2.26%		2.26%	
Operating margin (b)	1.98%	1.98%	10.00%		10.00%	
Tax rate	25.00%	25.00%	25.00%		25.00%	
Reinvestment (c)		Sales to capital ratio	2.00	RIR =	22.60%	
Return on capital	1.67%	Marginal ROIC =	24.53%		10.00%	
Cost of capital (d)		7.87%	8.00%		8.00%	

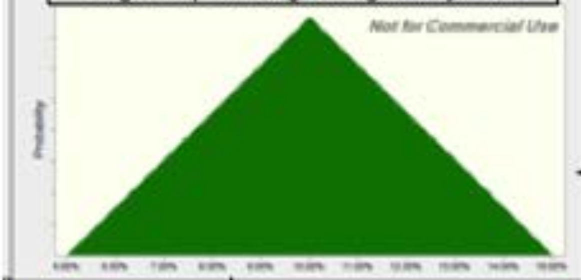
The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 29,372	3.58%	$ 1,053	$ 1,053	$ 3,389	$ (2,337)
2	$ 38,184	5.19%	$ 1,981	$ 1,981	$ 4,406	$ (2,425)
3	$ 45,821	6.79%	$ 3,112	$ 3,112	$ 3,818	$ (706)
4	$ 54,985	8.40%	$ 4,616	$ 3,751	$ 4,582	$ (831)
5	$ 65,982	10.00%	$ 6,598	$ 4,949	$ 5,498	$ (550)
6	$ 76,837	10.00%	$ 7,684	$ 5,763	$ 5,428	$ 335
7	$ 86,752	10.00%	$ 8,675	$ 6,506	$ 4,958	$ 1,549
8	$ 94,869	10.00%	$ 9,487	$ 7,115	$ 4,058	$ 3,057
9	$ 100,379	10.00%	$ 10,038	$ 7,528	$ 2,755	$ 4,773
10	$ 102,647	10.00%	$ 10,265	$ 7,699	$ 1,134	$ 6,564
Terminal year	$ 104,967	10.00%	$ 10,497	$ 7,873	$ 1,779	$ 6,093

The Value

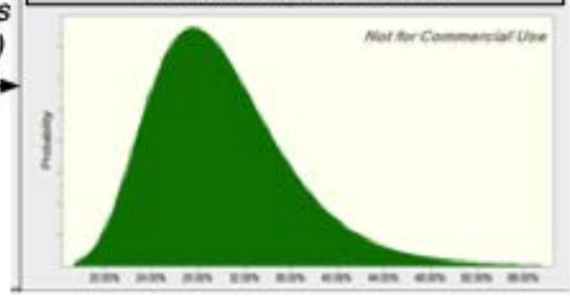
Terminal value	$ 106,156		
PV(Terminal value)	$ 49,594		
PV (CF over next 10 years)	$ 2,461		
Value of operating assets =	$ 52,055		
Adjustment for distress	$ 5,206	Default probability (based on rating) =	20.00%
- Debt & Mnority Interests	$ 14,658		
+ Cash & Other Non-operating assets	$ 2,198		
Value of equity	$ 34,389		
- Value of equity options	$ 805	32 million options (CEO package & convertibles), deep out of the money right now.	
Number of shares	176.42		
Value per share	$ 190.36	Stock was trading at =	$185.50

Target Operating Margin in year 5



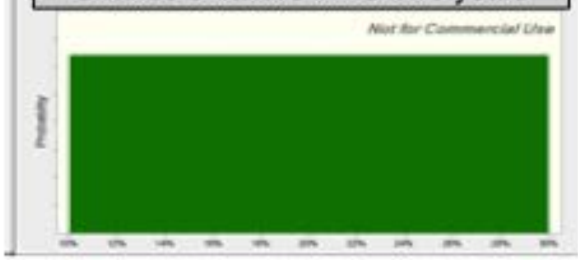
Revenue growth is positively correlated with operating margins (Correlation =0.4)

Revenue Growth Rate

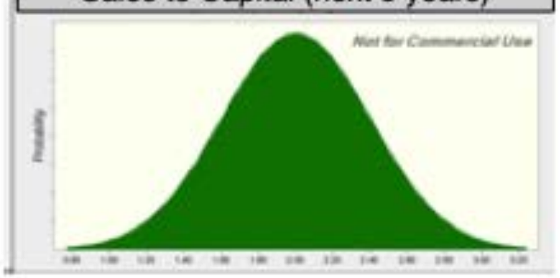


Lower operating margins increase likelihood of failure (Correlation = -0.5)

Chance of failure in next 10 years



Sales to Capital (next 5 years)



Percentile	*Value per share*
0%	-$278.50
10%	$51.78
20%	$89.79
30%	$120.85
40%	$150.50
50%	$180.07
60%	$211.59
70%	$248.74
80%	$299.94
90%	$380.94
100%	$2,398.33

Base Case = $190.36
Base Case with $60 floor = $199

Tesla: Valuation Simulation in June 2019
Stock Price on June 1, 2019 = $188

Tesla: Value Per Share in June 2019 (Simulation)

As companies mature, their stories become bounded..

Levi Strauss (IPO)						
The Story						
In its return to public markets, Levi Strauss is riding its iconic brand name to moderate growth and solid operating margins. It's brand name will persist, while the company pursues global growth while holding on to current operating margins, which are higher than the rest of the apparel business.						
The Assumptions						
	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 5,575	8.00%	2.45%		2.45%	Global growth opportunities
Operating margin (b)	11.60%	11.60%	11.60%		11.60%	Brand name allows margin preservation
Tax rate	18.41%	18.41%	25.00%		25.00%	Tax rate converges on global average
Reinvestment (c)		Sales to capital ratio	3.11	RIR =	24.50%	Hold to current investment efficiency
Return on capital	29.46%	Marginal ROIC =	36.11%		10.00%	Earn excess returns in long term
Cost of capital (d)		6.78%	6.95%		6.95%	Low cost of capital
The Cash Flows						
	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 6,021	11.60%	$ 698	$ 570	$ 143	$ 427
2	$ 6,503	11.60%	$ 754	$ 615	$ 155	$ 461
3	$ 7,023	11.60%	$ 815	$ 665	$ 167	$ 498
4	$ 7,585	11.60%	$ 880	$ 718	$ 180	$ 537
5	$ 8,192	11.60%	$ 950	$ 775	$ 195	$ 580
6	$ 8,757	11.60%	$ 1,016	$ 815	$ 181	$ 634
7	$ 9,263	11.60%	$ 1,074	$ 848	$ 163	$ 686
8	$ 9,695	11.60%	$ 1,124	$ 873	$ 139	$ 734
9	$ 10,040	11.60%	$ 1,164	$ 889	$ 111	$ 778
10	$ 10,286	11.60%	$ 1,193	$ 895	$ 79	$ 816
Terminal year	$ 10,538	11.60%	$ 1,222	$ 917	$ 225	$ 692
The Value						
Terminal value			$ 15,380			
PV(Terminal value)			$ 7,944			
PV (CF over next 10 years)			$ 4,189			
Value of operating assets =			$ 12,132			
Adjustment for distress			$ -		Probability of failure =	0.00%
- Debt & Mnority Interests			$ 2,324			
+ Cash & Other Non-operating assets			$ 713			
Value of equity			$ 10,522			
- Value of equity options			$ 284			
Number of shares			376.03			
Value per share			$ 27.23		Stock was trading at =	$22.00

And in decline, they can be depressing..

JC Penney in 2016: Road to Nowhere?

Declining business: Revenues expected to drop by 3% a year fo next 5 years

Margins improve gradually to median for US retail sector (6.25%)

As stores shut down, cash released from real estate.

The cost of capital is at 9%, higher because of high cost of debt.

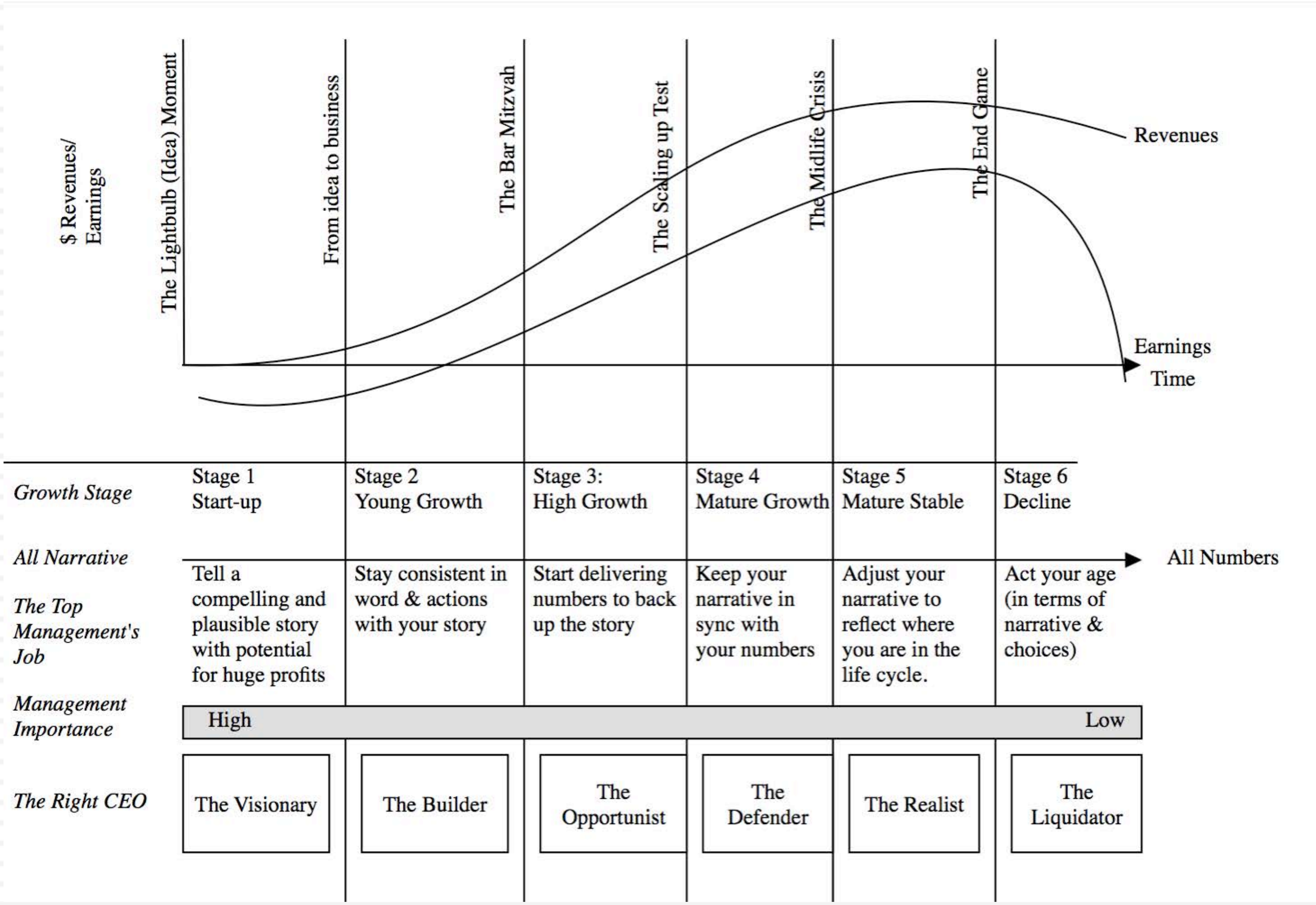
	Base year	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Revenue growth rate		-3.00%	-3.00%	-3.00%	-3.00%	-3.00%	-2.00%	-1.00%	0.00%	1.00%	2.00%
Revenues	$ 12,522	$12,146	$11,782	$11,428	$11,086	$10,753	$10,538	$10,433	$10,433	$10,537	$10,748
EBIT (Operating) margin	1.32%	1.82%	2.31%	2.80%	3.29%	3.79%	4.28%	4.77%	5.26%	5.76%	6.25%
EBIT (Operating income)	$ 166	$ 221	$ 272	$ 320	$ 365	$ 407	$ 451	$ 498	$ 549	$ 607	$ 672
Tax rate	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	36.00%	37.00%	38.00%	39.00%	40.00%
EBIT(1-t)	$ 108	$ 143	$ 177	$ 208	$ 237	$ 265	$ 289	$ 314	$ 341	$ 370	$ 403
- Reinvestment		$ (188)	$ (182)	$ (177)	$ (171)	$ (166)	$ (108)	$ (53)	$ -	$ 52	$ 105
FCFF		$ 331	$ 359	$ 385	$ 409	$ 431	$ 396	$ 366	$ 341	$ 318	$ 298
Cost of capital		9.00%	9.00%	9.00%	9.00%	9.00%	8.80%	8.60%	8.40%	8.20%	8.00%
PV(FCFF)		$ 304	$ 302	$ 297	$ 290	$ 280	$ 237	$ 201	$ 173	$ 149	$ 129
Terminal value	$ 5,710										
PV(Terminal value)	$ 2,479										
PV (CF over next 10 years)	$ 2,362										
Sum of PV	$ 4,841										
Probability of failure =	20.00%										
Proceeds if firm fails =	$2,421										
Value of operating assets =	$4,357										

High debt load and poor earnings put survival at risk. Based on bond rating, 20% chance of failure and liquidation will bring in 50% of book value

The Bottom Line for Investors

- To be a successful investor in early-stage businesses, you need to be a good judge of narrative.
  - Not only do you need to be able to find good stories to invest in, but you also have to be able to separate impossible stories (fairy tales) from plausible stories, and then providing support (financial or management) to make the plausible into the probable.
  - You will also get much bigger disagreements about value and story, across investors.
- To be a successful in mature businesses, you need to be able to use the numbers that the business has already produced to decide on a narrative that is right for it, and then invest in companies where (you believe) the market has a mistaken narrative.

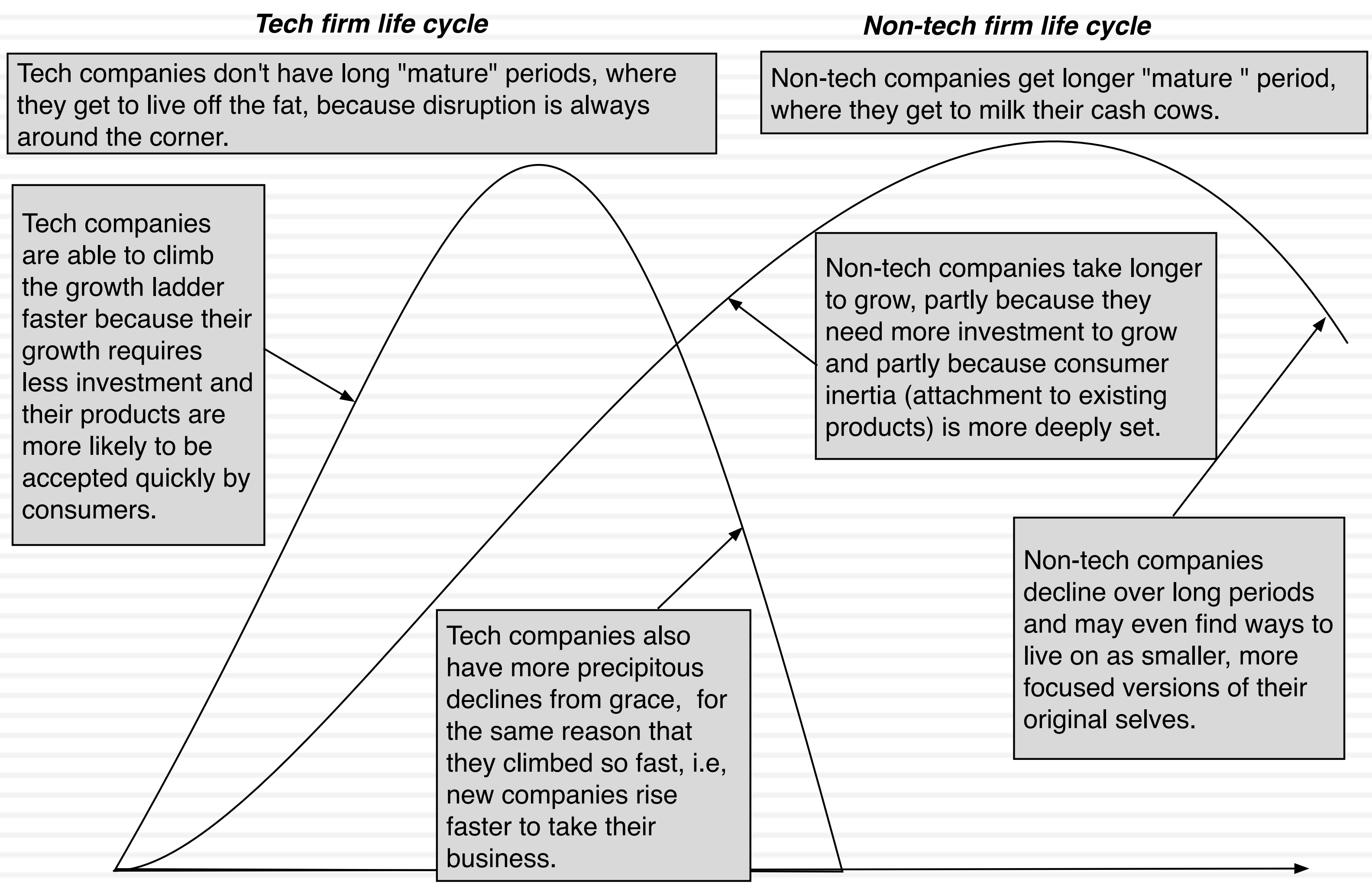
The Managerial Challenge



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.
- If managers don’t adapt to where their companies are in the life cycle, they can ruin these companies, if left in charge, or be pushed out of the companies, if investors have the power.

The Compressed Life Cycle?



The Consequences

- When life cycles were long, stretching over decades, time and aging allowed for smoother transitions, since CEOs aged with their companies, and moved on.
- As life cycles shorten, managers are far more likely to find their companies changing under them so quickly that they can no longer adapt.
  - To be a long tenured CEO, you will either need to be versatile and/or be able to delegate the work that you cannot do to people you empower and trust.
  - If these transitions are not well managed, there will be far more turnover in top management and activist investing will flourish.

Investors: Narrative or Numbers?

"Show me the money"

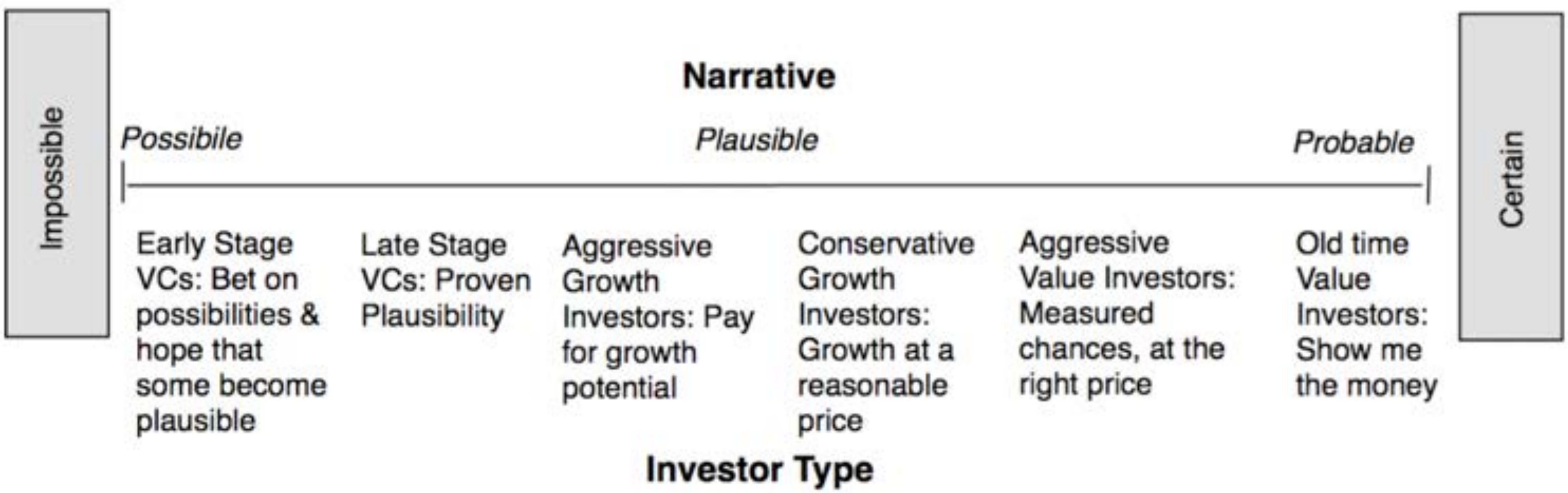
Investment Philosophy: Contrasts

- There is a sharp disagreement among investors as to what makes an investor successful.
  - At the one end are those from the old time value investing school, who believe that investing should always be about the numbers, often reflecting assets that a company already owns. Everything else (growth, business stories) are viewed as speculation.
  - At the other are those that believe that investment success comes from getting stories (both macro and micro) right, not from grinding through the numbers for every company.
- Neither side sees much merit in the other side's argument.

The Investor Challenge

Growth stage	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 & 5 Mature Stable	Stage 6 Decline
Key Questions	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?
Pricing Metrics & Measures	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)
Narrative vs Numbers	Mostly or all narrative	More narrative than numbers	Mix of narrative & numbers	More numbers than narrative	Mostly or all numbers
Value Drivers	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
Dangers	*Macro delusions*, where companies are collectively overpriced, given market size.	*Value distractions*, with focus on wrong revenue drivers.	*Growth illusions*, with failure to factor in the cost of growth.	*Disruption Denial*, with failure to see threats to sustainable profits.	*Liquidation leakage*, with unrealistic assumptions about what others will pay for liquidated assets.
Transitions	*Potential to Product*	*Product to Revenues*	*Revenues to Profits*	*Profits to Cash flows*	

Investment Philosophies & Narratives



There is no one pathway to investing nirvana..

- Successful Value investors
  - Work primarily with numbers (financial ratios, pricing metrics)
  - Will tend to invest in mature companies with stable and clear stories
- Successful Growth investors
  - Make their investments primarily based upon stories
  - Will tend to invest in companies with big and expansive stories that pass the plausibility test.
- Both sides will view the other side as deluded, but they will both be better at what they do, if they can work on their weak sides.

The End

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