

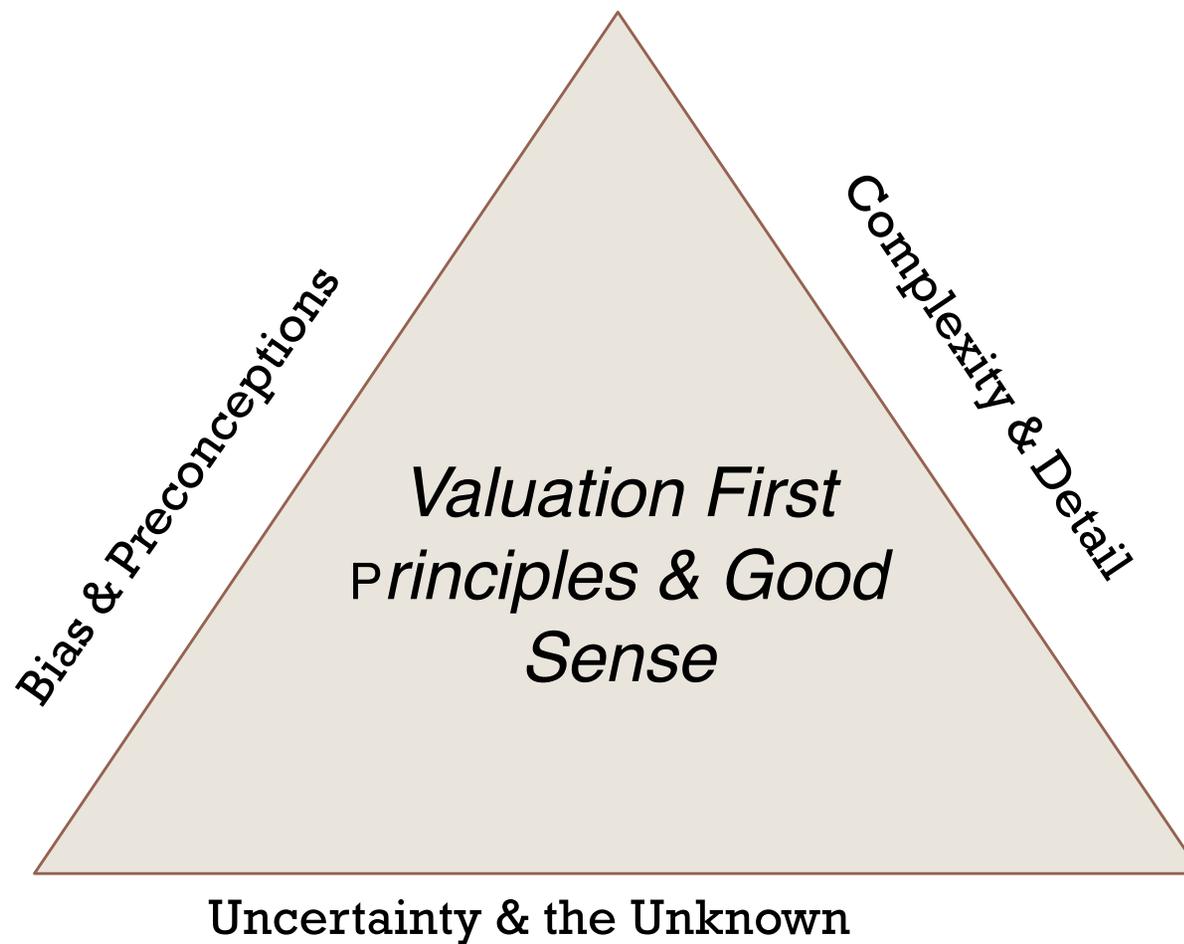
# **NUMBERS AND NARRATIVE: MODELING, STORY TELLING AND INVESTING**

Aswath Damodaran

# VALUATION: SCIENCE, ART OR SOMETHING ELSE?

- In a science, if you get the inputs right, you should get the output right. The laws of physics and mathematics are universal and there are no exceptions. **Valuation is not a science.**
- In an art, there are elements that can be taught but there is also a magic that you either have or you do not. The essence of an art is that you are either a great artist or you are not. **Valuation is not an art.**
- A craft is a skill that you learn by doing. The more you do it, the better you get at it. **Valuation is a craft.**

# THE BERMUDA TRIANGLE OF VALUATION





# INTRINSIC VALUATION 101

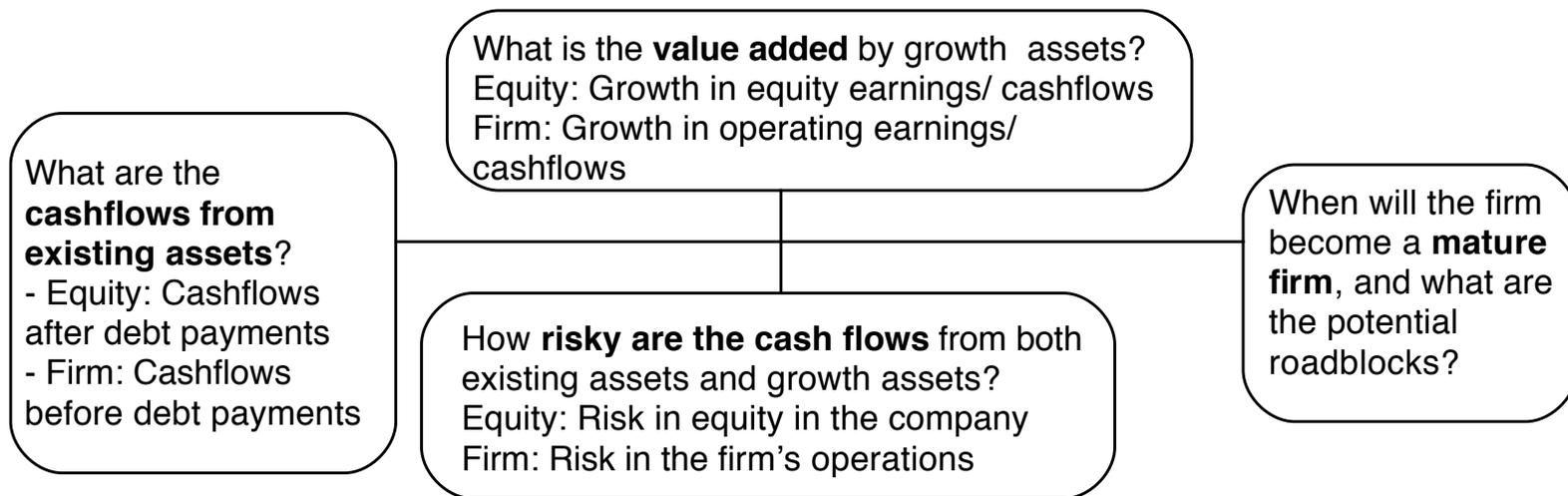
# DCF: UNRAVELING THE MYSTERIES

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

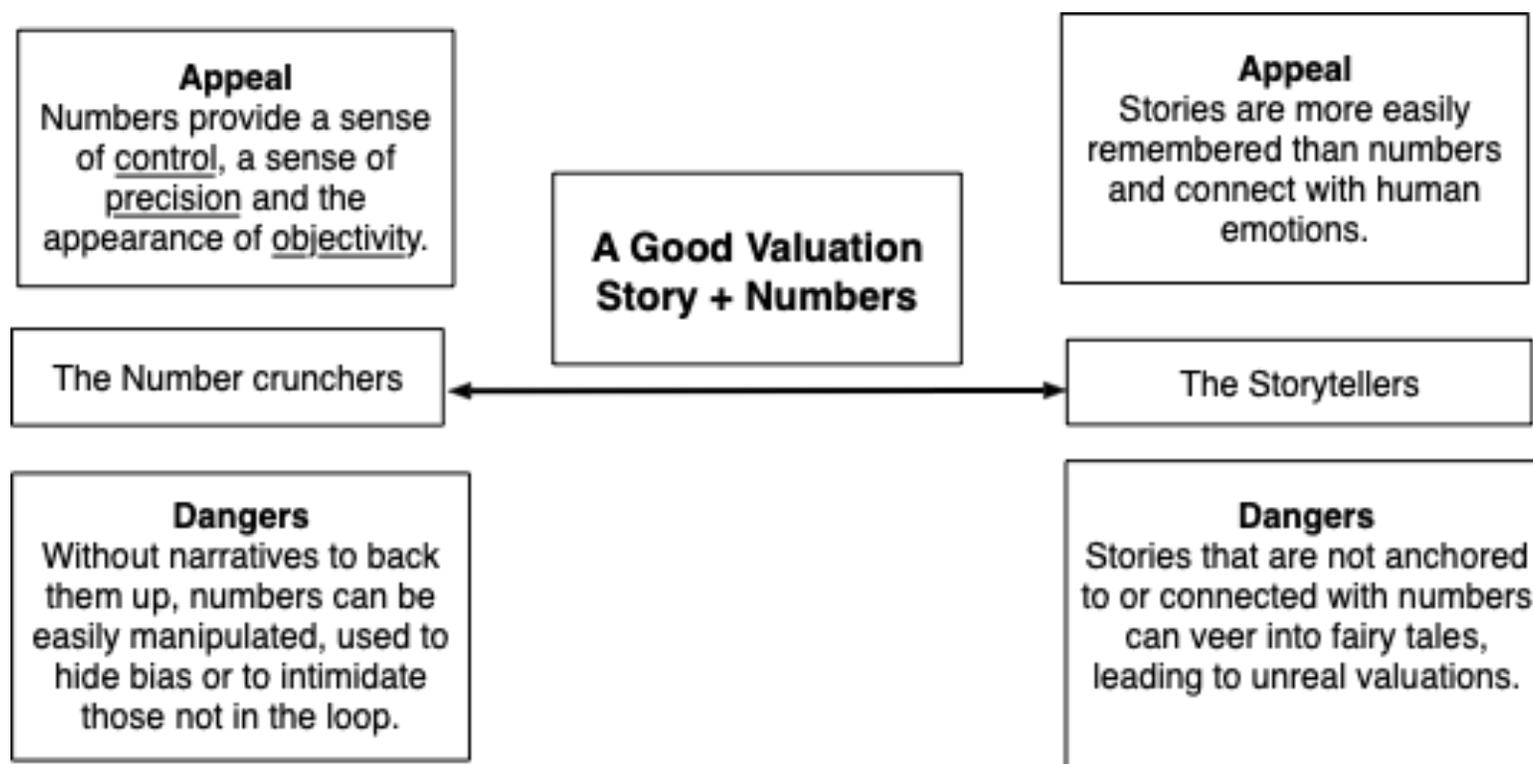
$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \dots + \frac{E(CF_n)}{(1+r)^n}$$

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

# THE KEY QUESTIONS IN VALUATION...



# THEME 3: GOOD VALUATION = STORY + NUMBERS



# DCF AS A TOOL FOR INTRINSIC VALUATION

## Value of growth

The future cash flows will reflect expectations of how quickly earnings will grow in the future (as a positive) and how much the company will have to reinvest to generate that growth (as a negative). The net effect will determine the value of growth.  
Expected Cash Flow in year  $t = E(CF) = \text{Expected Earnings in year } t - \text{Reinvestment needed for growth}$

## Cash flows from existing assets

The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

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

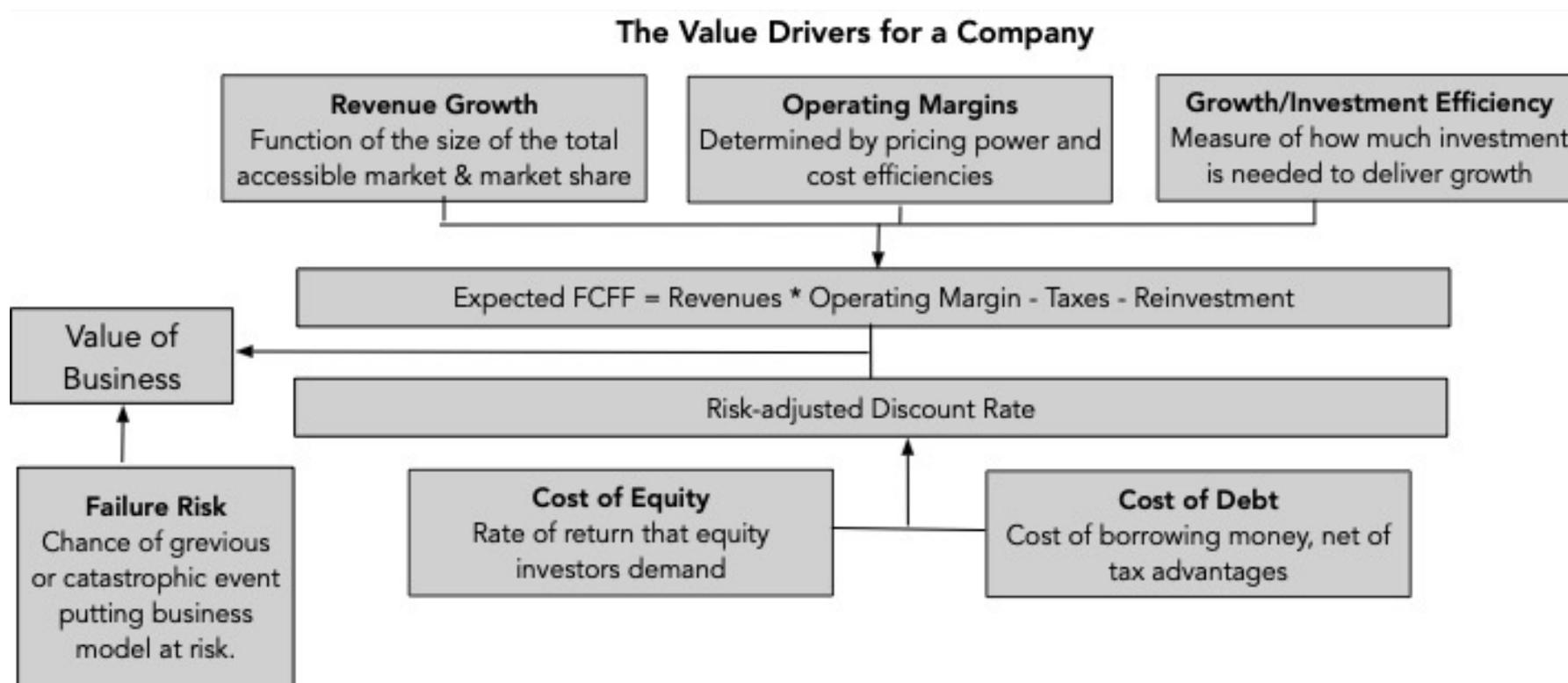
## Steady state

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

## Risk in the Cash flows

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

# AND BUSINESS DRIVERS THAT DETERMINE VALUE...



# 1. REVENUE GROWTH

## Revenue Growth and Magnitude

### Market Size and Growth

1. *Current Market size*: The size of the market for the company's products & services, given geography it is targeting and product type.
2. *Expected Growth in Market*: Growth in total market, as technology and market conditions change.

X

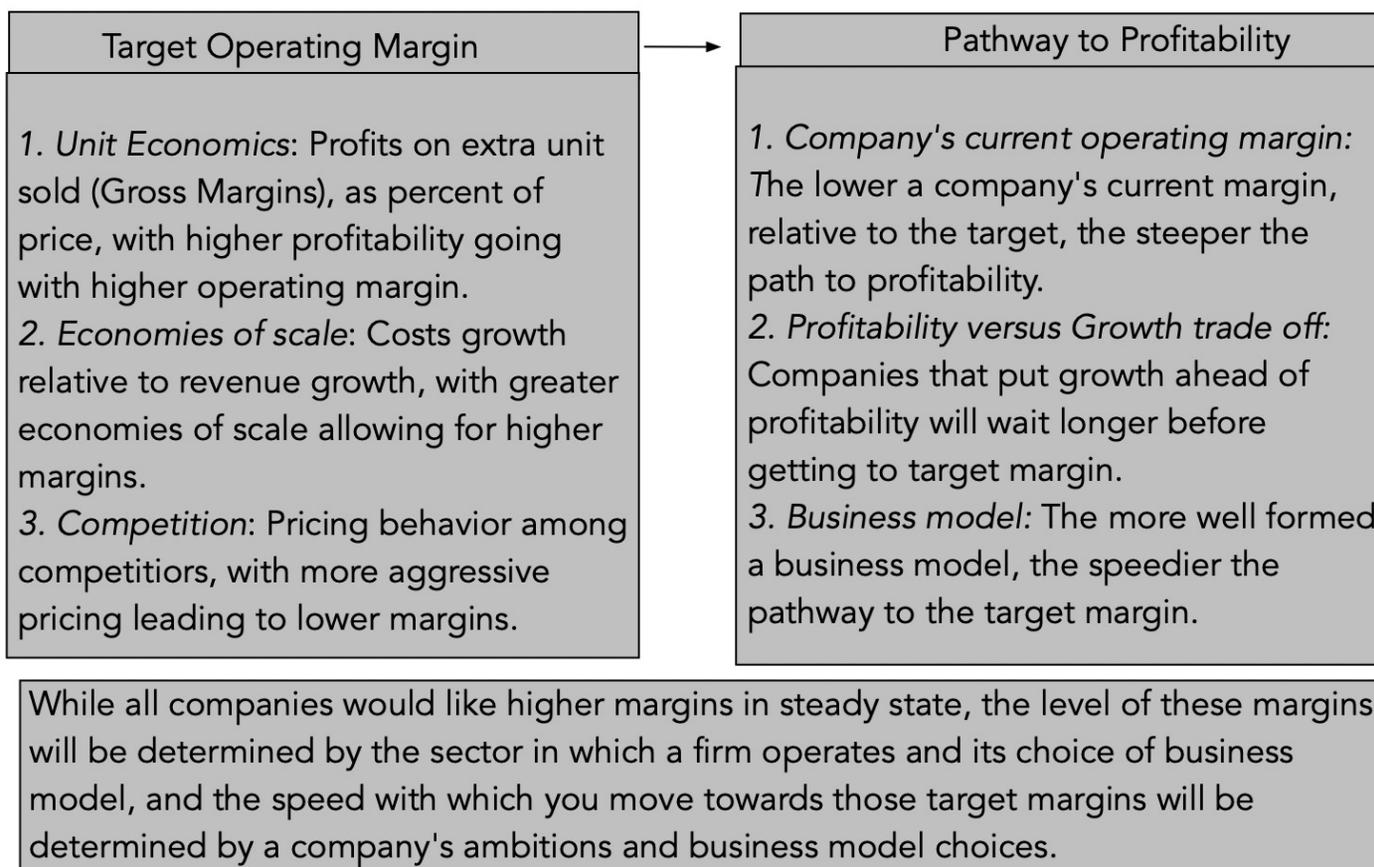
### Market Share

1. *Company's current market share*: If company's current market share is low, potential for growth in market share at expense of competition.
2. *Industry economics*: Nature of the business ( a few big winners or splintered competition).
3. *Strength of company's competitive advantages*: Stronger and more sustainable competitive advantages should allow for higher market share.

The potential for revenue growth is greater for companies with small revenues (and market share) in a big and growing market, especially if the company has strong competitive advantages in winner-take-all businesses.

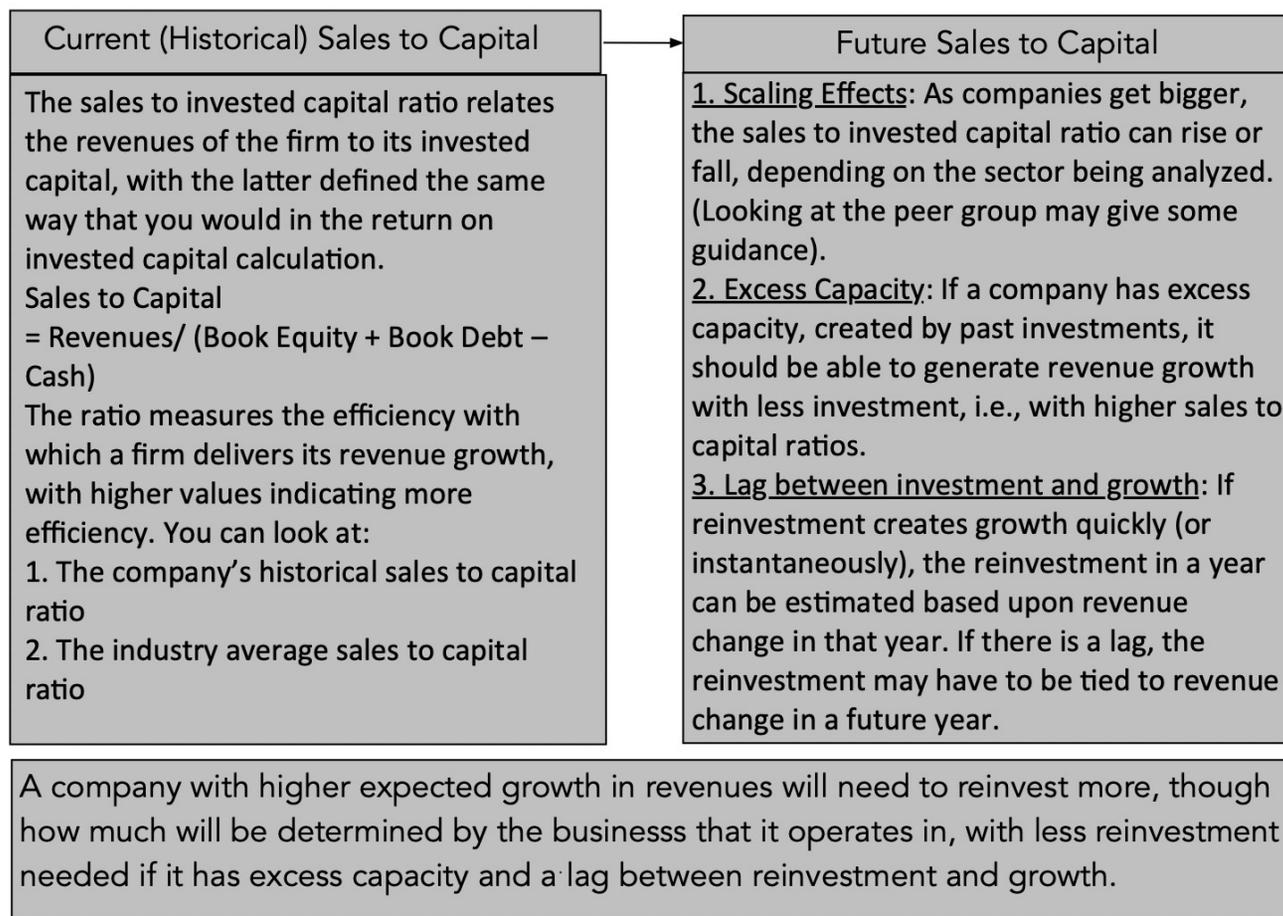
## 2. TARGET MARGINS (AND PATH THERE)...

### Operating Margin: Target and Pathway



# 3. SALES TO INVESTED CAPITAL: A PATHWAY TO ESTIMATING REINVESTMENT

## Sales to Invested Capital: Reinvestment





# STORIES OR NUMBERS?

# 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?
- At your current job or position, do you find yourself hanging out with people who are like you (in inclination and training)?

# 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.

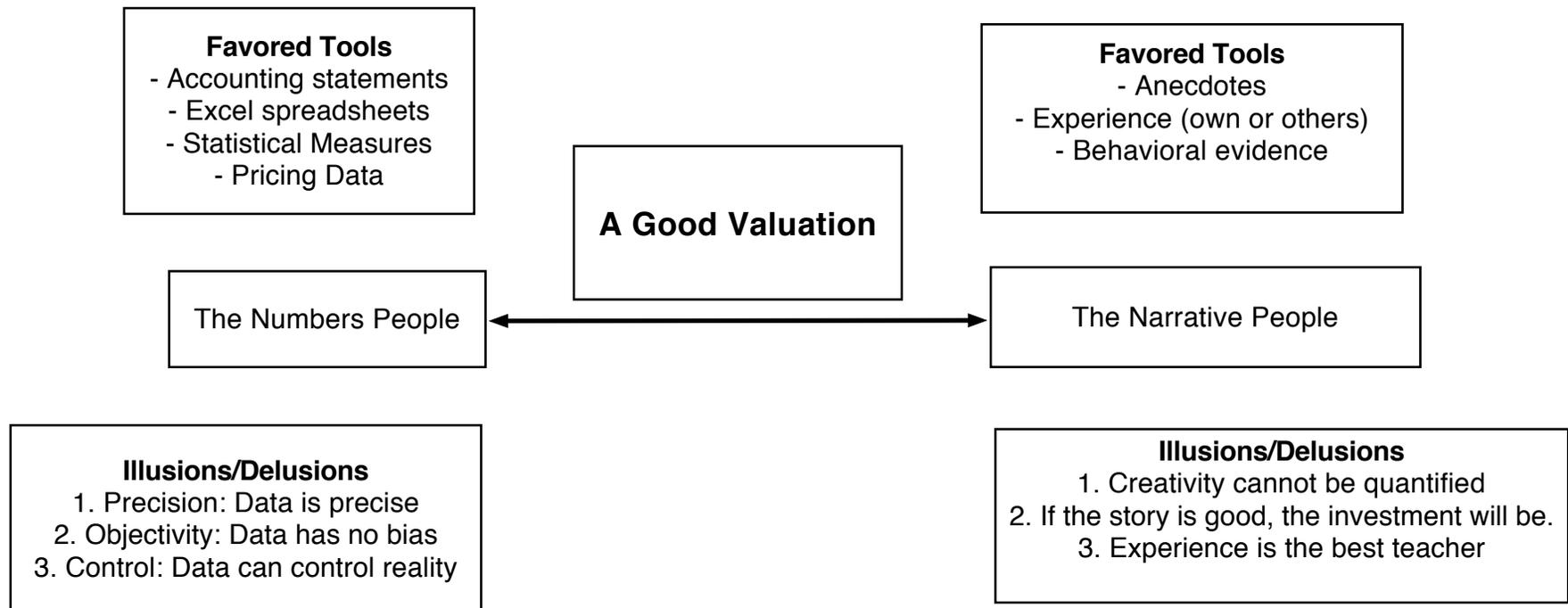
# THE DELUSIONS OF THE NUMBER CRUNCHERS

- 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

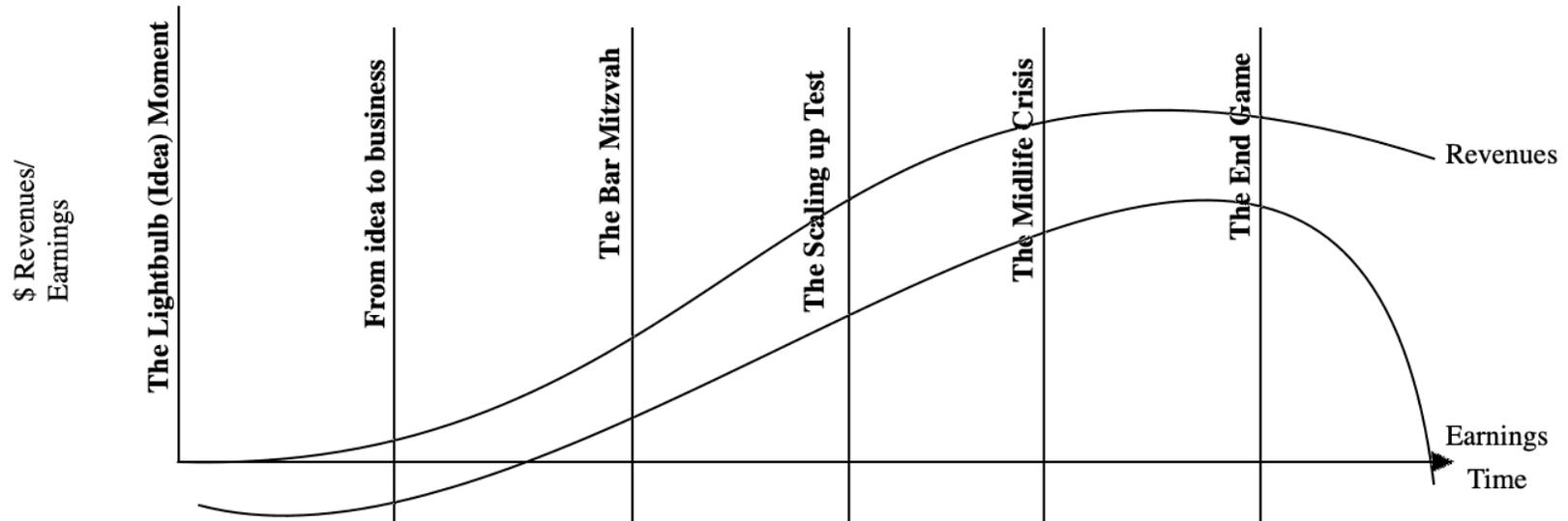
1. Number crunchers don't dream in technicolour: Creativity and Numbers are mutually exclusive. If you talk about numbers, you cannot be creative, and if you are being creative, talk about numbers only crimps your creative instincts.
2. Creativity is deserving of reward: If your story is good, your business 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



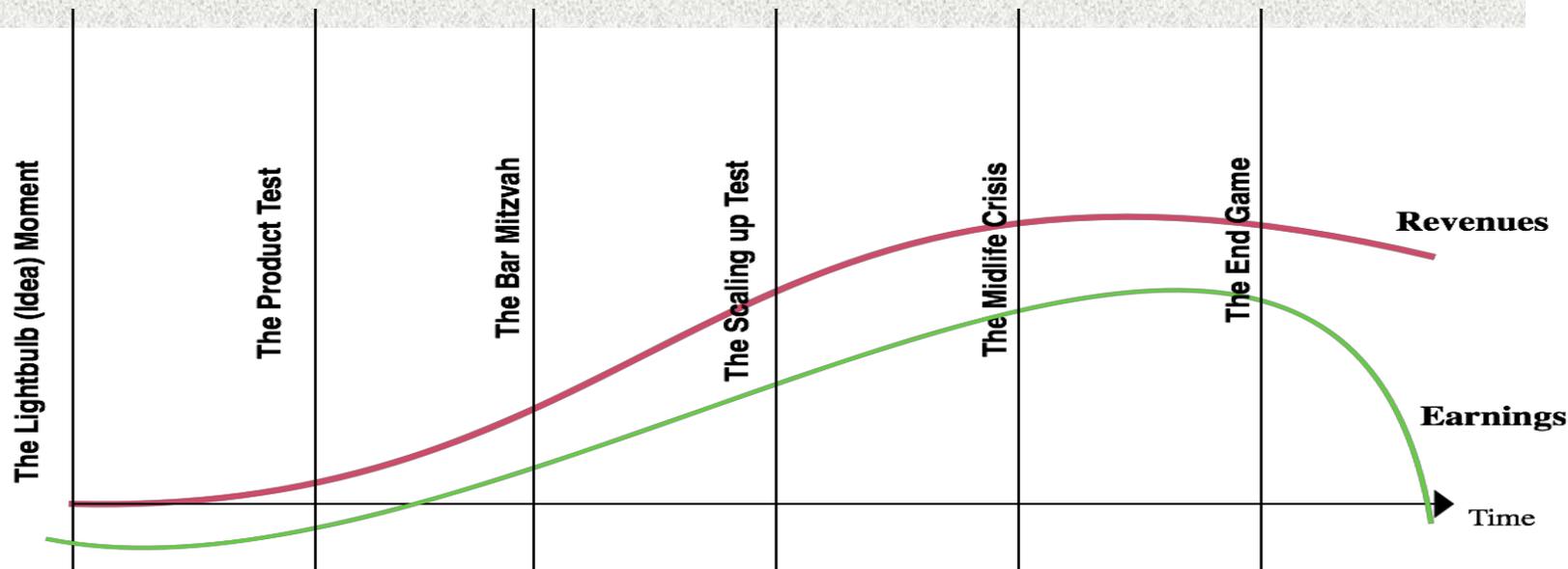


# A LIFE CYCLE VIEW OF UNCERTAINTY



<b>Growth stage</b>	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
<b>Uncertainty about</b>	Does the idea have potential?	Is there a business model for the idea to be commercialized?	Will the business model generate profits?	Can the business be scaled up?	Can the business be defended?	Will management face reality?
<b>Type &amp; Magnitude</b>	<i>Company specific</i>		<i>Macro worries</i>		<i>Company specific</i>	

# IN VALUE, THE EMPHASIS SHIFTS AS WELL, FROM NARRATIVE TO NUMBERS...

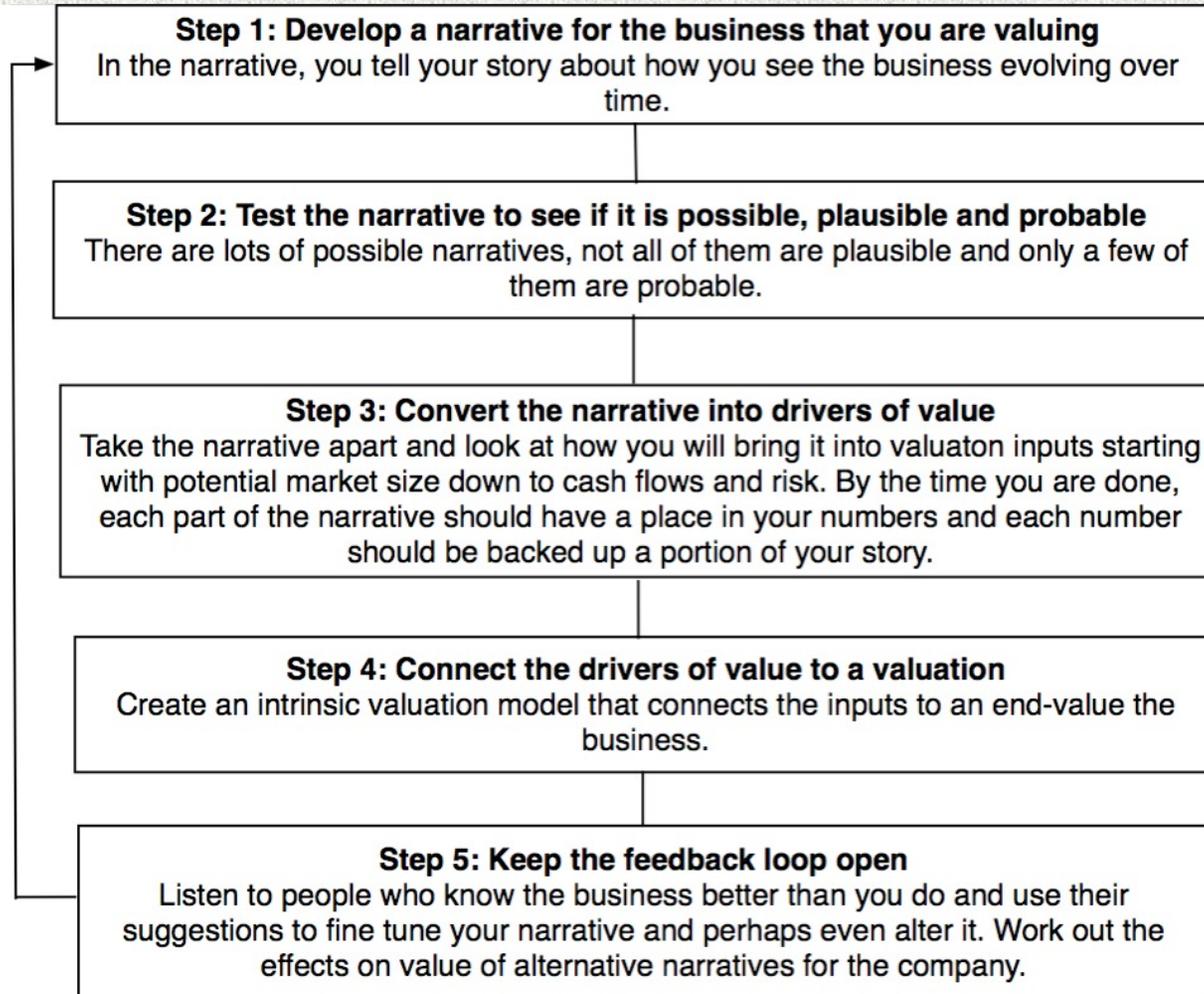


<i>Lifecycle stage</i>	Start-up	Young Growth	High Growth	Mature Growth	Mature Stable	Decline
<i>Narrative versus Numbers</i>	All Narrative	Mostly narrative	Narrative + Numbers	Numbers + Narrative	Mostly Numbers	All Numbers
<i>Narrative Drivers</i>	How big is the narrative?	How plausible is narrative?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



# FROM STORIES TO NUMBERS: A FIVE-STEP APPROACH

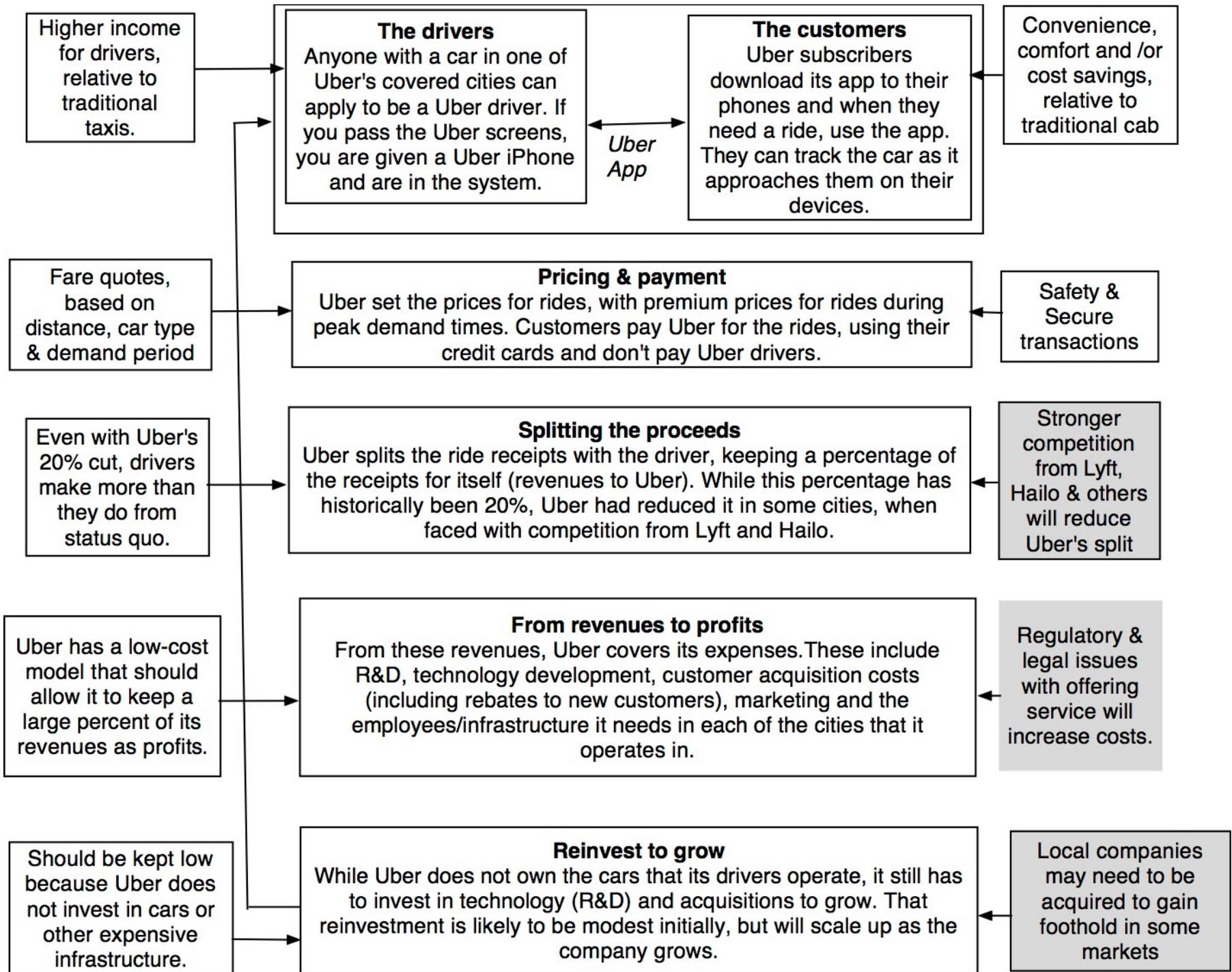
# THE STEPS



# 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



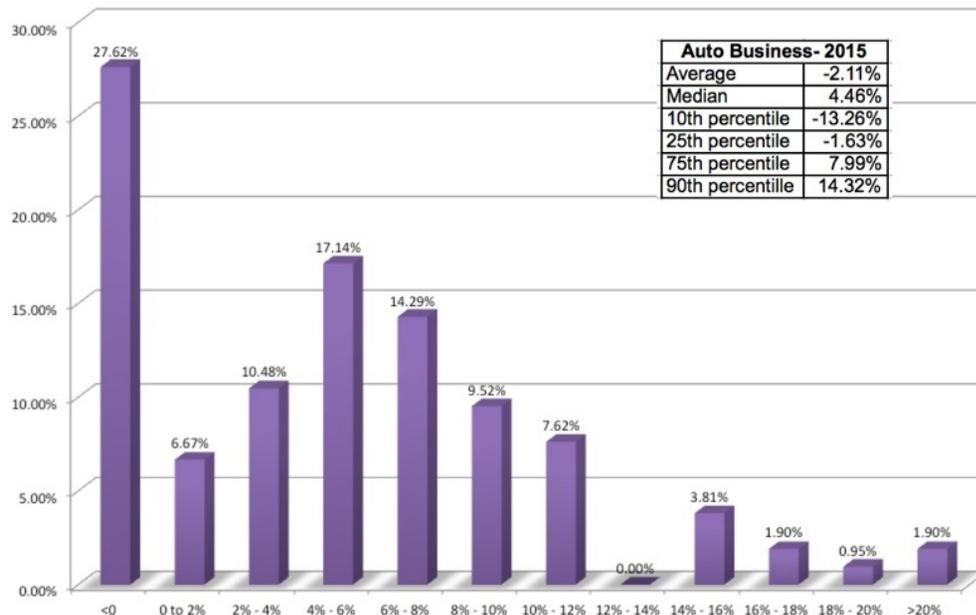
# Understanding Ferrari in 2015

## 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%

The Automobile Business: Pre-tax Operating Margins in 2015

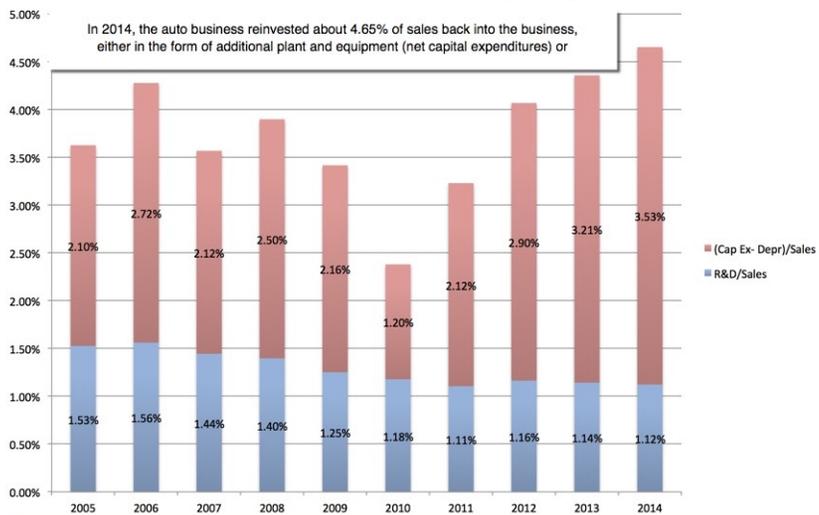


Auto Business- 2015	
Average	-2.11%
Median	4.46%
10th percentile	-13.26%
25th percentile	-1.63%
75th percentile	7.99%
90th percentile	14.32%

+

## High & Increasing Reinvestment

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



## 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%

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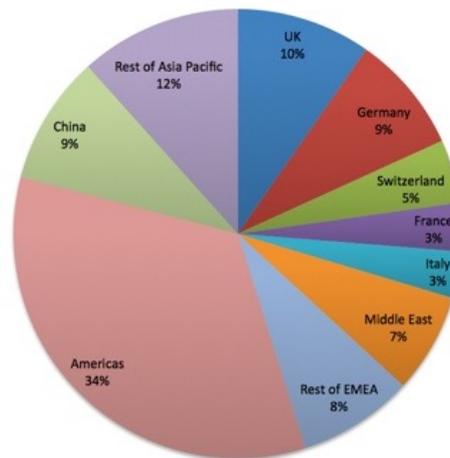
Only once in the last 10 years have auto companies collectively earned more than their cost of capital

# 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: Geographical Sales (2014)*



Ferrari had a profit margin of 18.2%, in the 95<sup>th</sup> 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

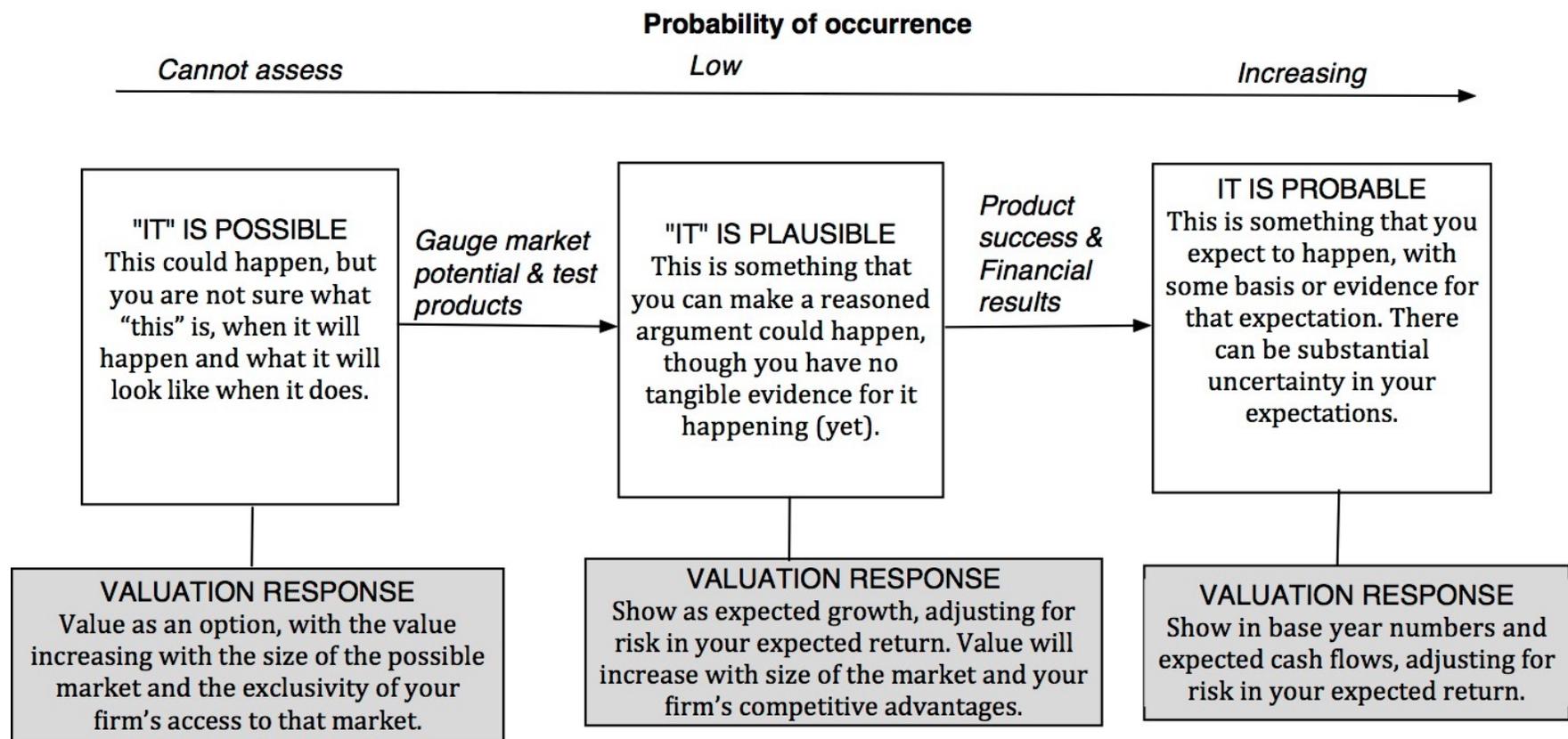
In June 2014, my initial narrative for Uber was that it would be

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 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.

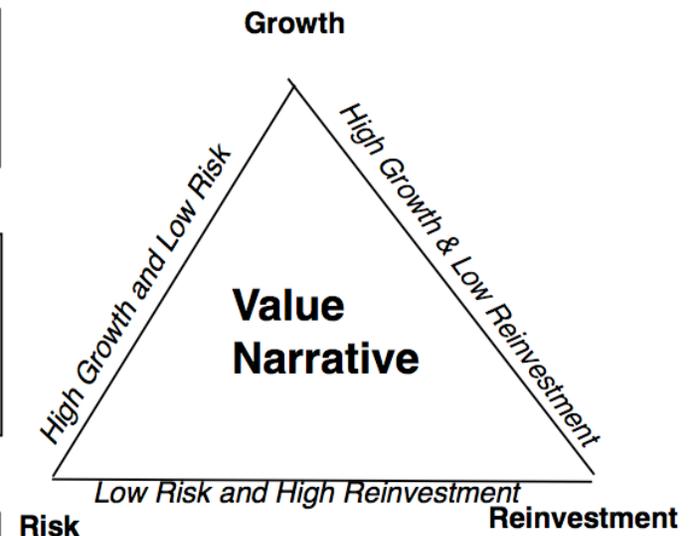
## The Implausible

**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



# 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%	79%	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
<b>Total Sales</b>	<b>2,478</b>	<b>3,361</b>	<b>5,655</b>	<b>7,095</b>	<b>10,072</b>	<b>12,768</b>	<b>16,736</b>	<b>21,648</b>	<b>26,403</b>	<b>31,416</b>	<b>36,959</b>	<b>42,087</b>	<b>48,017</b>	<b>54,355</b>	<b>61,296</b>	<b>68,059</b>
% Growth		36%	60%	25%	42%	27%	31%	29%	22%	19%	18%	14%	14%	13%	13%	11%
<b>EBITDA</b>	<b>148</b>	<b>417</b>	<b>920</b>	<b>1,042</b>	<b>1,586</b>	<b>2,150</b>	<b>3,138</b>	<b>4,066</b>	<b>4,857</b>	<b>5,723</b>	<b>6,328</b>	<b>7,182</b>	<b>8,144</b>	<b>9,688</b>	<b>10,874</b>	<b>12,099</b>
% 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%	59%	65%	62%	69%	78%	86%	79%	77%	79%	76%	76%	76%	76%	77%
<b>EBIT</b>	<b>45</b>	<b>259</b>	<b>748</b>	<b>839</b>	<b>1,285</b>	<b>1,796</b>	<b>2,749</b>	<b>3,529</b>	<b>4,252</b>	<b>5,027</b>	<b>5,517</b>	<b>6,244</b>	<b>7,056</b>	<b>8,429</b>	<b>9,423</b>	<b>10,439</b>
% Margin	1.8%	7.7%	13.2%	11.8%	12.8%	14.1%	16.4%	16.3%	16.1%	15.0%	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
<b>Pretax Income</b>	<b>46</b>	<b>258</b>	<b>758</b>	<b>872</b>	<b>1,332</b>	<b>1,886</b>	<b>2,857</b>	<b>3,684</b>	<b>4,451</b>	<b>5,305</b>	<b>5,875</b>	<b>6,688</b>	<b>7,598</b>	<b>9,080</b>	<b>10,207</b>	<b>11,373</b>
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%
<b>Net Income</b>	<b>44</b>	<b>256</b>	<b>744</b>	<b>839</b>	<b>1,246</b>	<b>1,624</b>	<b>2,395</b>	<b>3,043</b>	<b>3,644</b>	<b>4,303</b>	<b>4,741</b>	<b>5,372</b>	<b>6,128</b>	<b>7,319</b>	<b>8,179</b>	<b>9,050</b>
<b>Plus</b>																
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
<b>Less</b>																
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
<b>Unlevered Free Cash Flow</b>	<b>78</b>	<b>229</b>	<b>750</b>	<b>863</b>	<b>1,186</b>	<b>1,702</b>	<b>2,343</b>	<b>2,884</b>	<b>3,314</b>	<b>4,113</b>	<b>4,472</b>	<b>4,959</b>	<b>5,456</b>	<b>6,597</b>	<b>7,315</b>	<b>8,005</b>

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

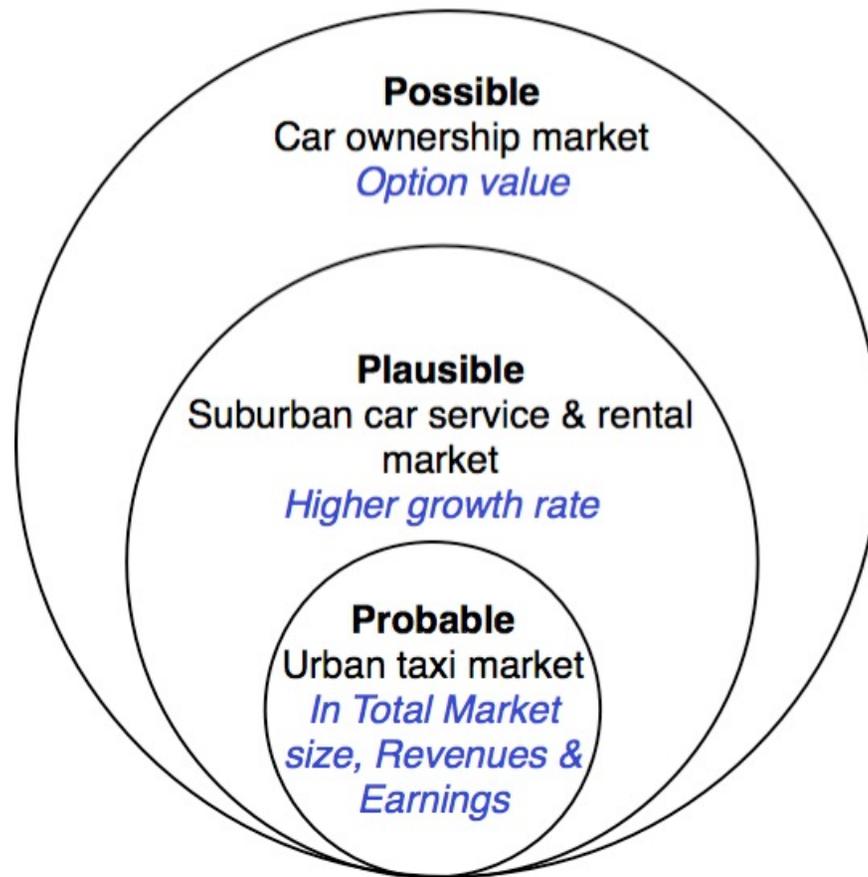
Exit EBITDA High	12.0 x	Exit PPG High	5.0%	Exit P/Sales High	180%
Exit EBITDA Low	8.0 x	Exit PPG Low	3.0%	Exit P/Sales Low	130%

Discount Rate High	13.0%	FY Month of Valuation	1.0 (Beginning of this Month)
Discount Rate 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.

Uber (My narrative))



# BIG STORY OR SMALL ONE?

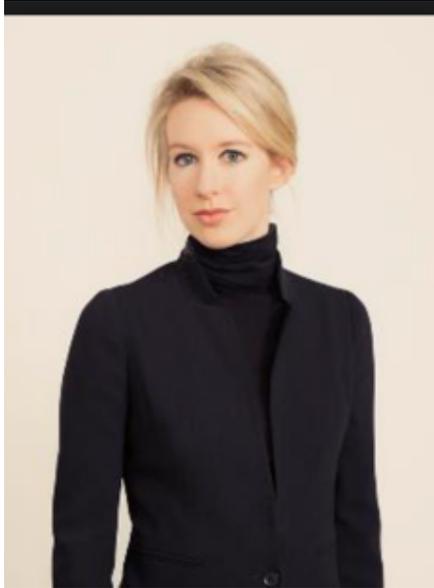
- The upside of a big story is that it will generally deliver a higher value for your company, if you can get others to believe it is plausible and probable.
- The downside is two-fold:
  - Your sales job becomes a lot more difficult, as your story gets bigger. In fact, there is a danger that you could 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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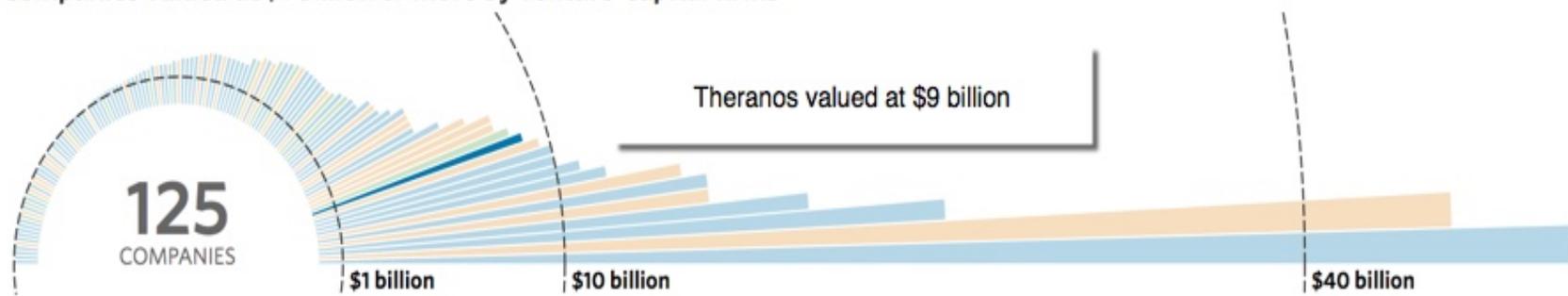
The Checks (?)

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



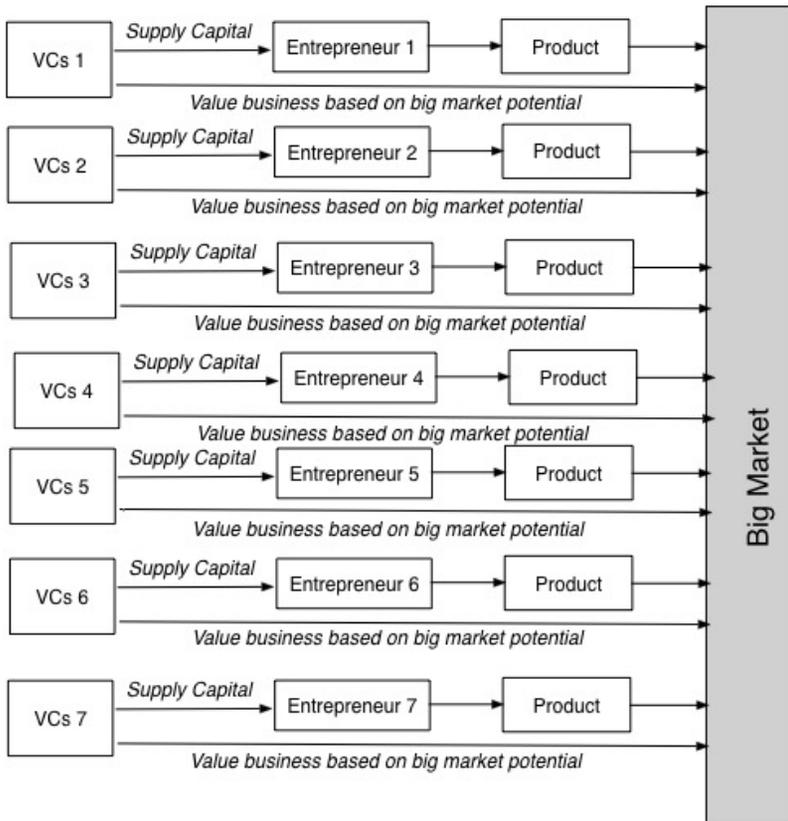
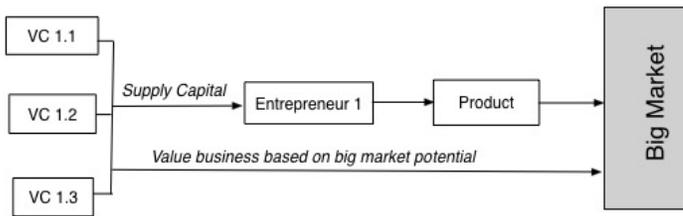
Valuations as of October 2015

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

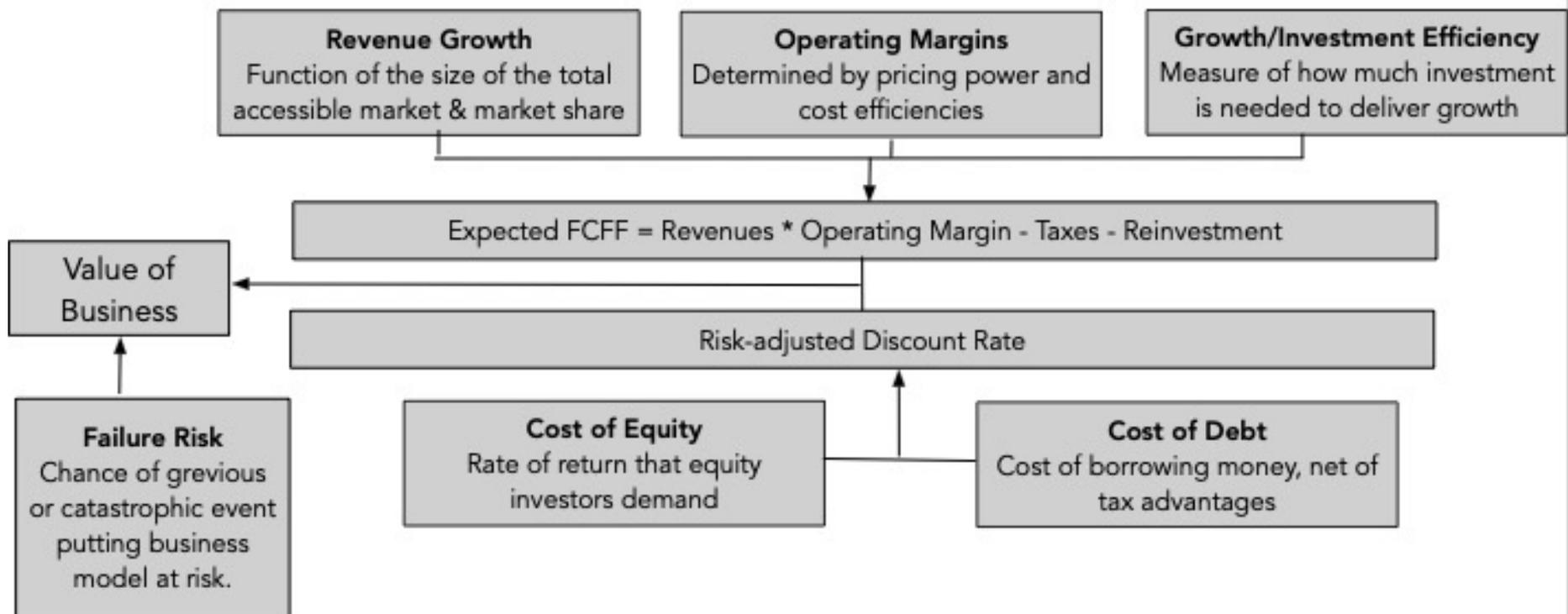


Company	Market Cap	Enterprise Value	Current Revenues	Breakeven Revenues (2025)	% from Online Advertising	Imputed Online Ad Revenue (2025)
Google	\$441,572.00	\$386,954.00	\$69,611.00	\$224,923.20	89.50%	\$201,306.26
Facebook	\$245,662.00	\$234,696.00	\$14,640.00	\$129,375.54	92.20%	\$119,284.25
Yahoo!	\$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
<b>Total US</b>	<b>\$770,185.90</b>	<b>\$689,817.00</b>	<b>\$96,183.00</b>	<b>\$434,185.98</b>		<b>\$388,972.66</b>
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
<b>Total non-US</b>	<b>\$474,131.00</b>	<b>\$444,613.00</b>	<b>\$50,379.00</b>	<b>\$248,495.46</b>		<b>\$133,415.32</b>
<b>Global Total</b>	<b>\$1,244,316.90</b>	<b>\$1,134,430.00</b>	<b>\$146,562.00</b>	<b>\$682,681.44</b>		<b>\$522,387.98</b>

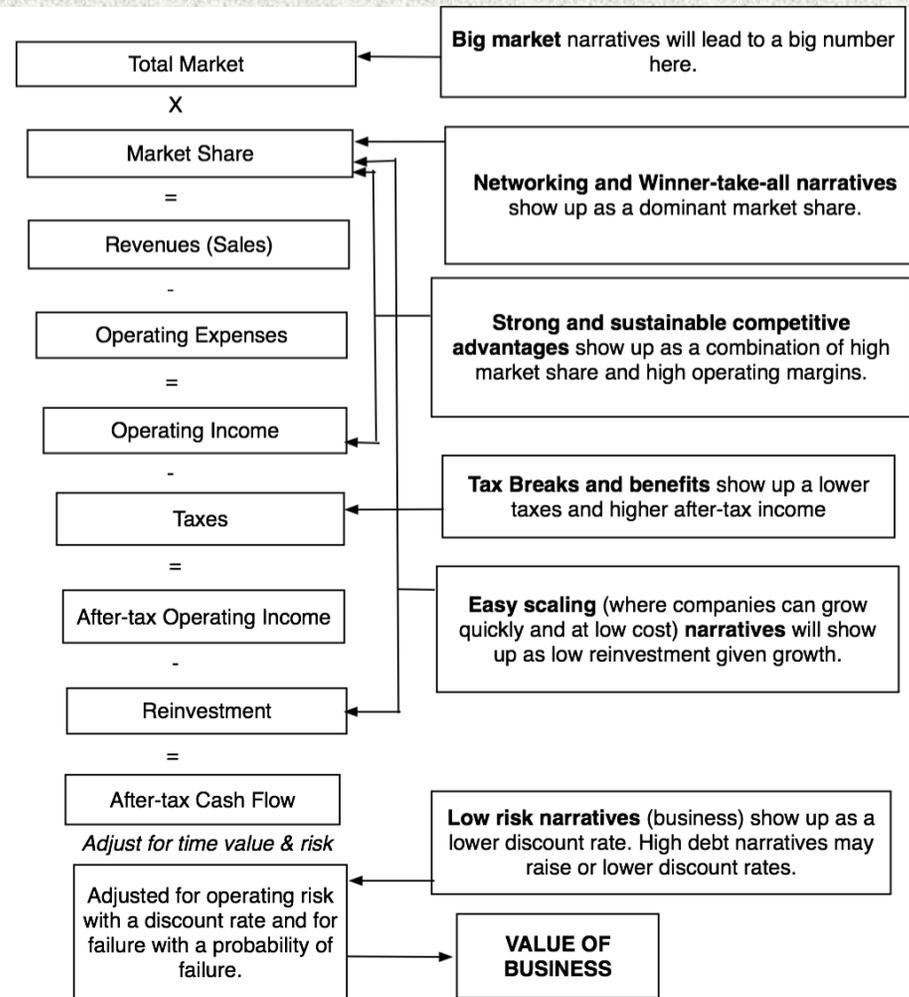


# STEP 4A: THE DRIVERS OF VALUE

## The Value Drivers for a Company

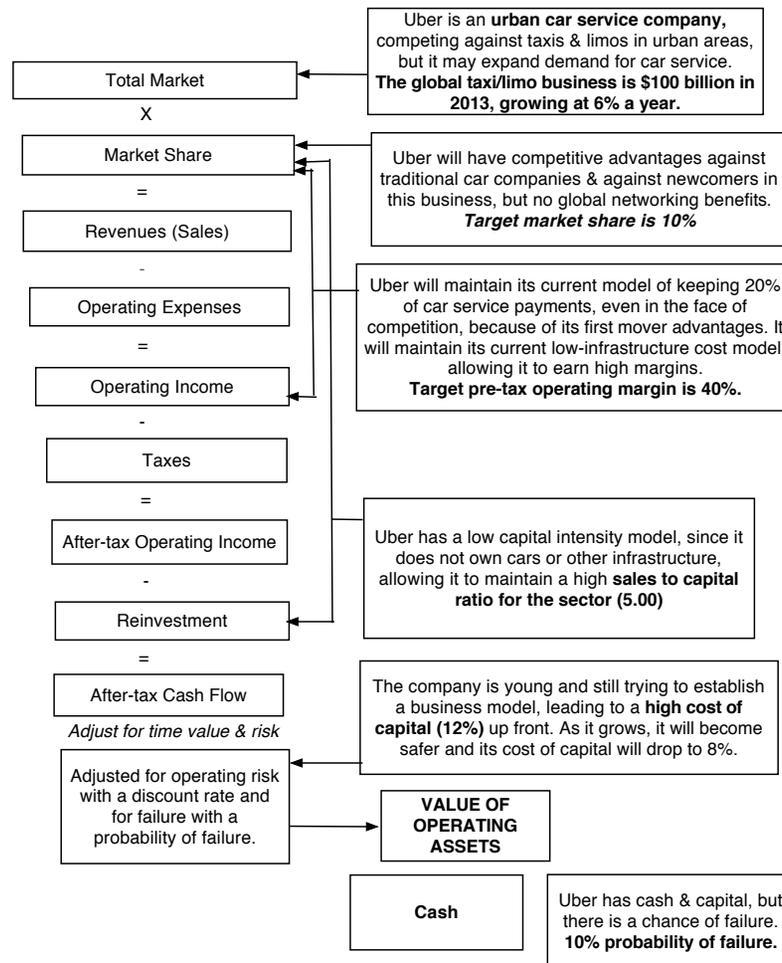


# CONNECT YOUR NARRATIVE TO KEY DRIVERS OF VALUE



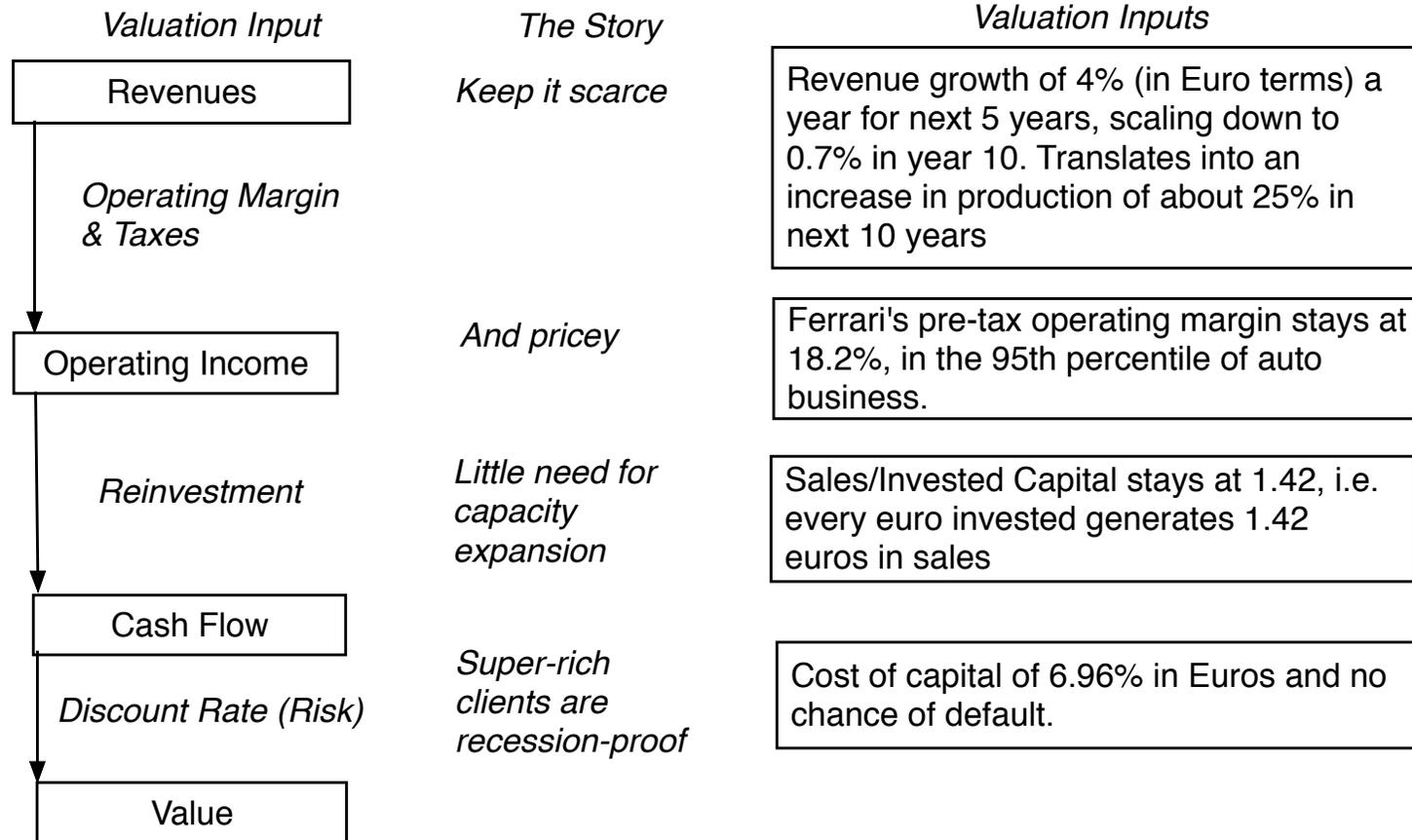
# THE UBER LINK

## The Uber narrative (June 2014)



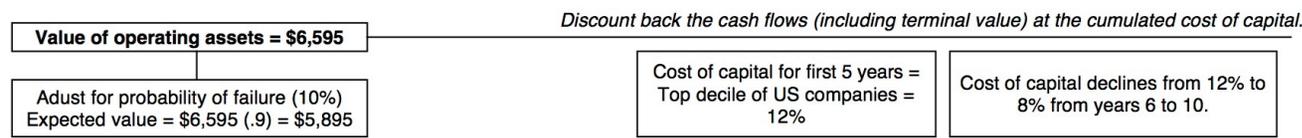
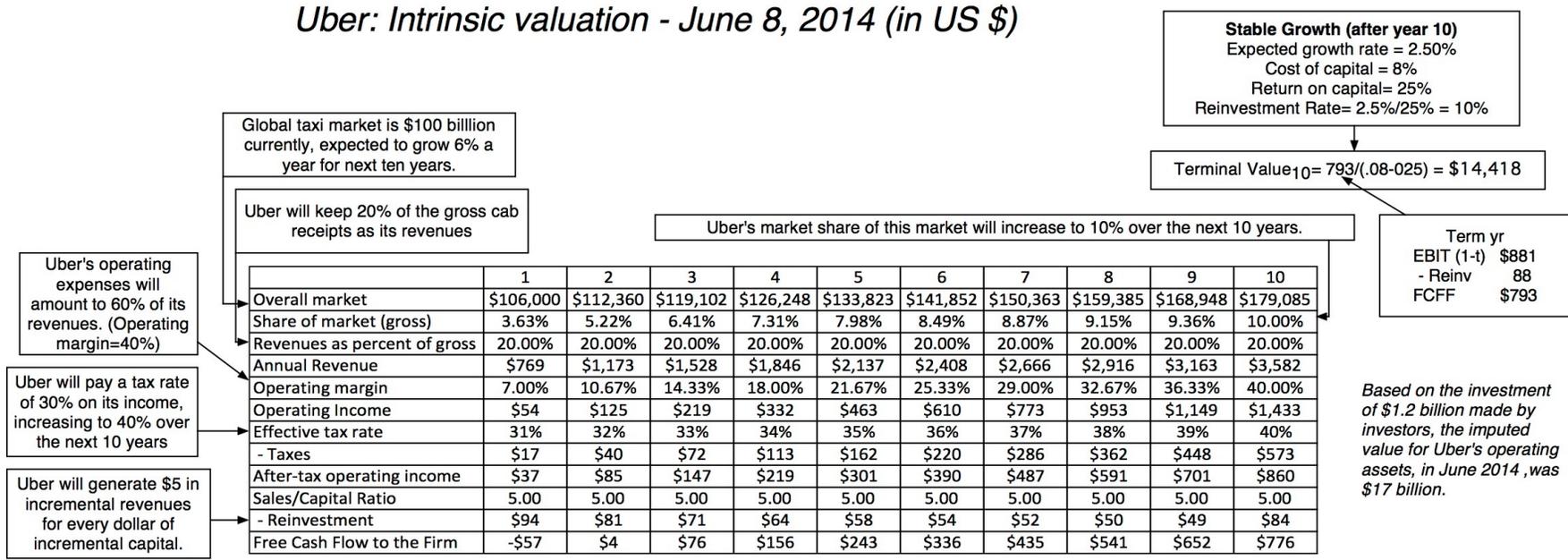
# FERRARI: FROM STORY TO NUMBERS

## Ferrari: The Exclusive Club



# STEP 4B: VALUE THE COMPANY (UBER)

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



# 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

# THE FANGAM STOCKS, IN JANUARY 2010

- The Lagging Giant: At the start of 2010, Microsoft had a market capitalization in excess of \$270 billion, and was second only to Exxon Mobil, with a market cap of \$320 billion, but that represented a come down from its status as the largest market cap company at the start of 2000, with a market cap exceeding \$500 billion.
- The Rising Star: At the start of 2010, Apple's market cap was approaching \$200 billion, a quantum leap from its market cap of \$16 billion, ten years earlier.
- The Field of Dreams Company: By early 2010, Amazon had cemented its status as online retailer, capable of growing its revenues at the expense of its brick and mortar competitors, but without a clear pathway to profitability. The market seemed to be willing to overlook this limitation, giving the company a market cap of more than \$50 billion, a significant comeback from the dot-com bust days of 2001, when it was valued at less than \$4 billion.
- The New Tech Prototype: In January 2010, Google was already the prototype for the new tech model, reaching a hundred-billion dollar market cap threshold than any other company in history, with a market capitalization of more than \$160 billion in early 2010.
- On the cusp: In early 2010, it is unlikely that anyone would have put Netflix on the list of big-time winners, since its market capitalization was less than \$4 billion and its business model of renting content and signing up subscribers was already under strain.
- The glimmer in the market's eye: At the start of 2010, Facebook was still a private business, though venture capitalists were clearly excited about its prospects, pricing it at roughly \$14 billion in January 2010, based primarily on its user numbers.

# VALUING THE FANGAM STOCKS: REFRAMING THE STORY IN 2020

<i>Company</i>	<i>Sept 2020 Narrative</i>	<i>Information/News</i>	<i>Feb 2022 Narrative</i>
<b>Facebook</b>	Will use its immense & engaged platform to continue to grow its online advertising business, notwithstanding regulatory moves on privacy.	Name change & recent drop in user number suggest that backlash is having an effect on growth.	User platform remains key asset, but growth will be constrained & costs will increase, as regulators and competitors push back on privacy.
<b>Amazon</b>	Disruption platform, targeting any large business where the status quo is inefficient. Biggest challenge it faces is regulatory/legal pushback.	In the face of pressure from politicians and regulators, its business model was resilient, delivering sustained revenue growth & improving margins.	Disruption platform rolls on, allowing for continued growth and improving margins. Regulators will try to constrain the company, but given its reach across businesses & geographies, they will fall short in stopping
<b>Netflix</b>	The subscription machine will keep adding users, even in the face of competition, and content costs will scale down over time.	Disney+ represents the most significant competition in the streaming business yet, and the chase for users is becoming more difficult and costly.	Netflix will continue to try grow its subscriber base, but it will find it more expensive to grow and more difficult to get content costs under control, as competitors also play the content game.
<b>Google</b>	The search engine will continue to be drive earnings and cash flows, but the company's other business bets will start paying off, augmenting growth over time.	Google continued to see growth in the online ad business, perhaps at the expense of Facebook, while increasing its profit margins.	The search engine and online advertising will remain the center of Google's business model, but its investments in other businesses will start delivering profits.
<b>Apple</b>	The smartphone company, living (and dying) off the success of the iPhone, but its services business will continued to grow, adding to its revenues and delivering high margins.	More of the same, as the iPhone continued to deliver, and Apple services continued to grow.	The company will stay the course, and bring more of its supply chain under its own control. In keeping with its history, the company will not over reach (no expensive acquisitions or entering unfamiliar businesses).
<b>Microsoft</b>	The company will continue its transition from being a software company to a platform company, augmenting its growth and profits with its cloud business.	The acquisition of Activision expands Microsoft's platform business into gaming, and brings in young users who are lightly represented on the company's existing platforms.	The multiple platforms (Office 365, LinkedIn and Activision) will give the company many sources of revenue and perhaps opportunities to cross sell, allowing for continued growth and sustained high margins.

## **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

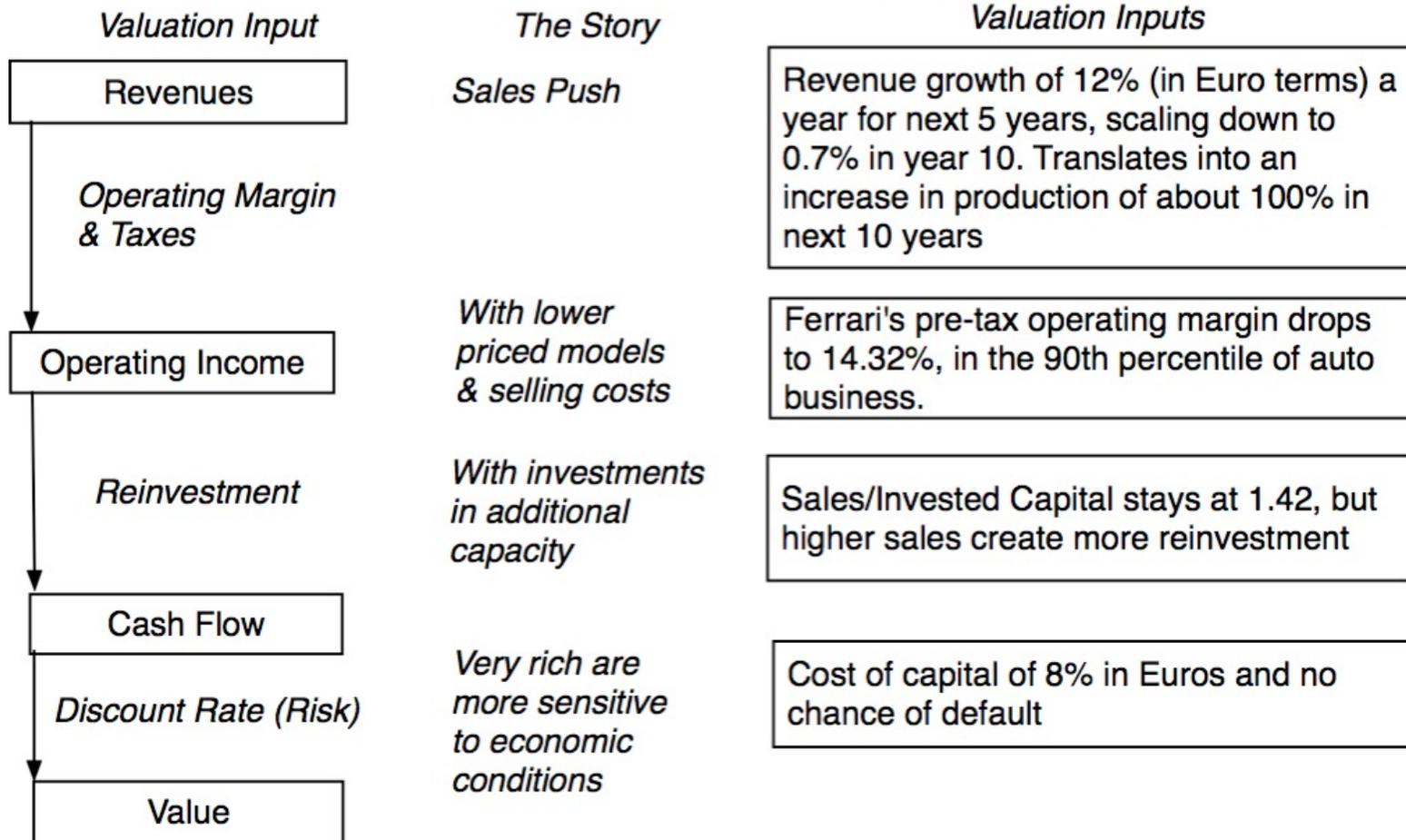
	<i>Uber (Gurley)</i>	<i>Uber (Gurley Mod)</i>	<i>Uber (Damodaran)</i>
Narrative	Uber will <u>expand the car service market substantially</u> , bringing in mass transit users & non-users from the suburbs into the market, and use its <u>networking advantage</u> to gain a <u>dominant market share</u> , 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 Option



# 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

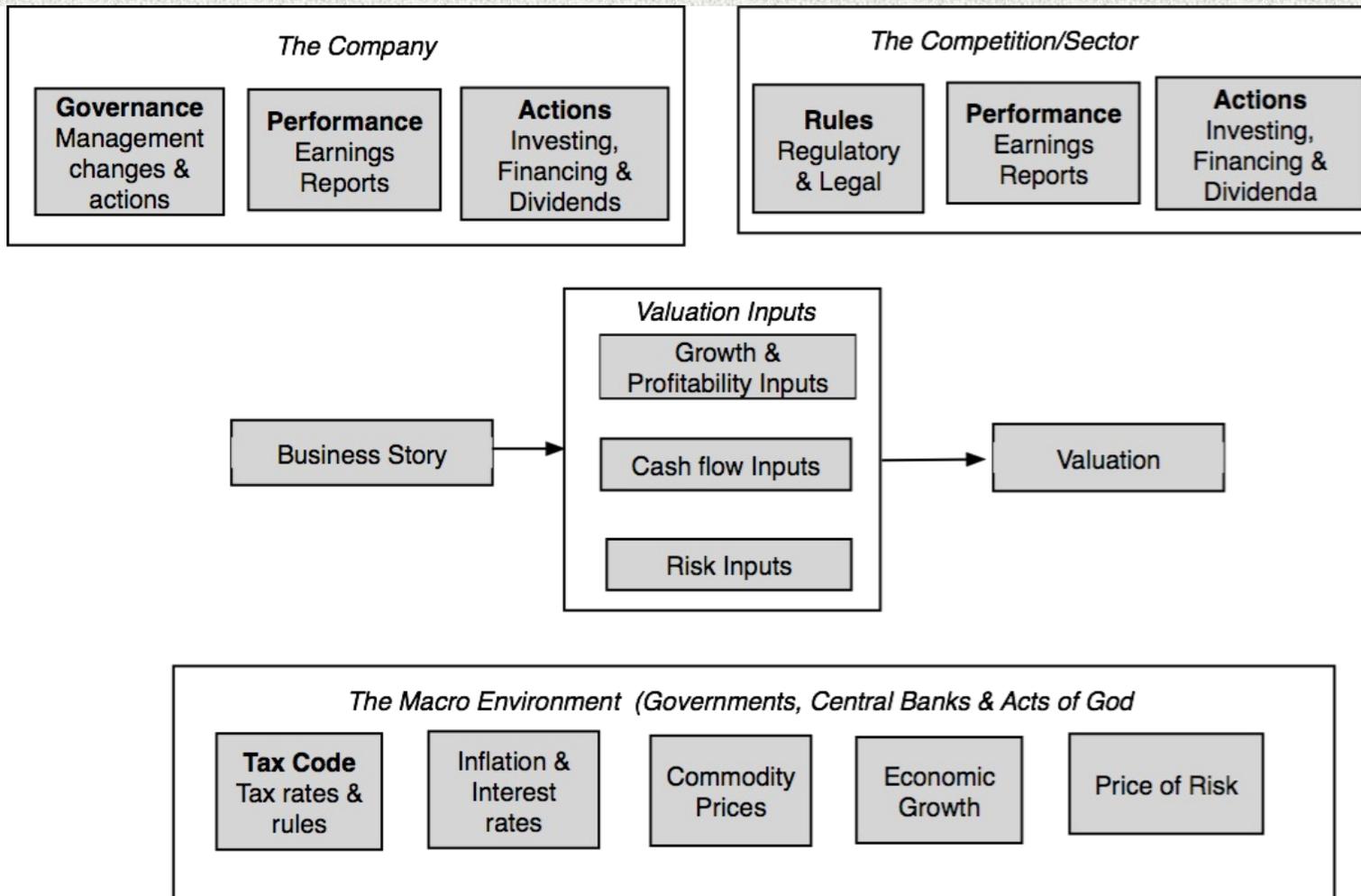
# AND THE WORLD IS FULL OF FEEDBACK.. MY FERRARI AFTERTHOUGHT!





# STORY BREAKS, CHANGES AND SHIFTS

# WHY NARRATIVES CHANGE



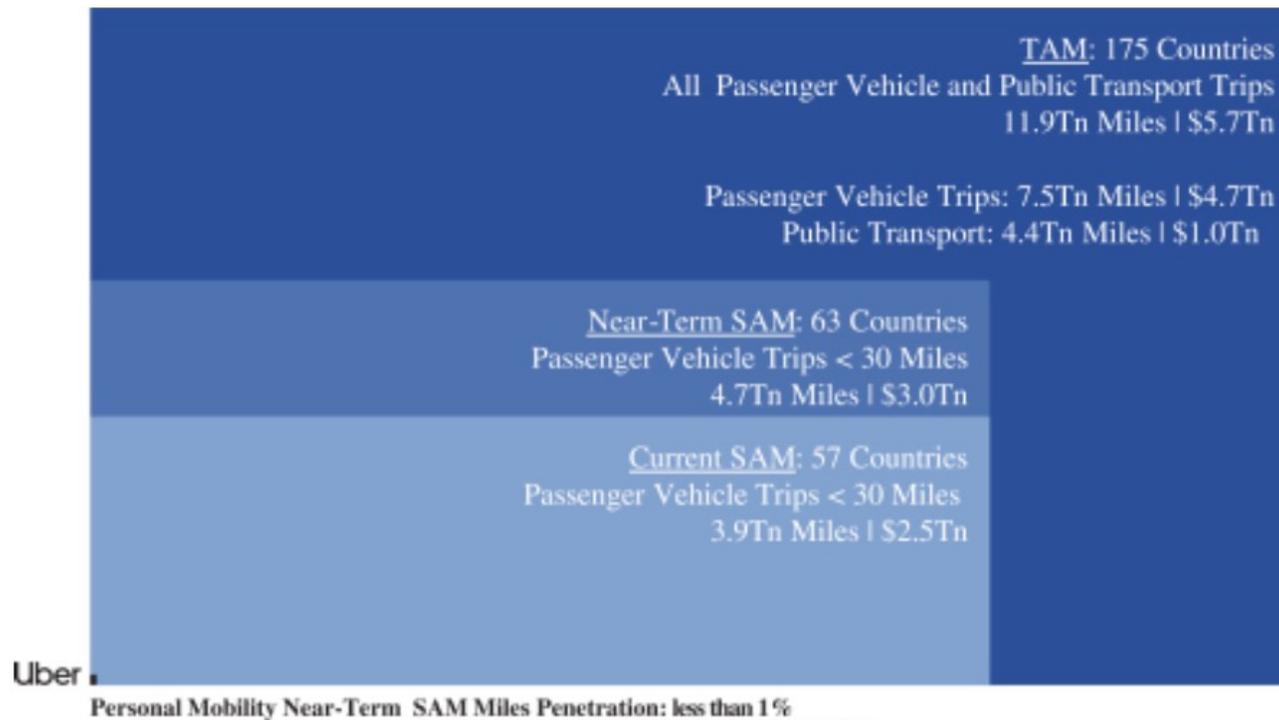
# HOW NARRATIVES CHANGE

<b>Narrative Break/End</b>	<b>Narrative Shift</b>	<b>Narrative Change (Expansion or Contraction)</b>
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

# THE UBER IPO IN 2019: 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 ambitions 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	<b>5% chance of failure, if pricing meltdown leads to capital being cut off</b>				Cash on hand + Capital access

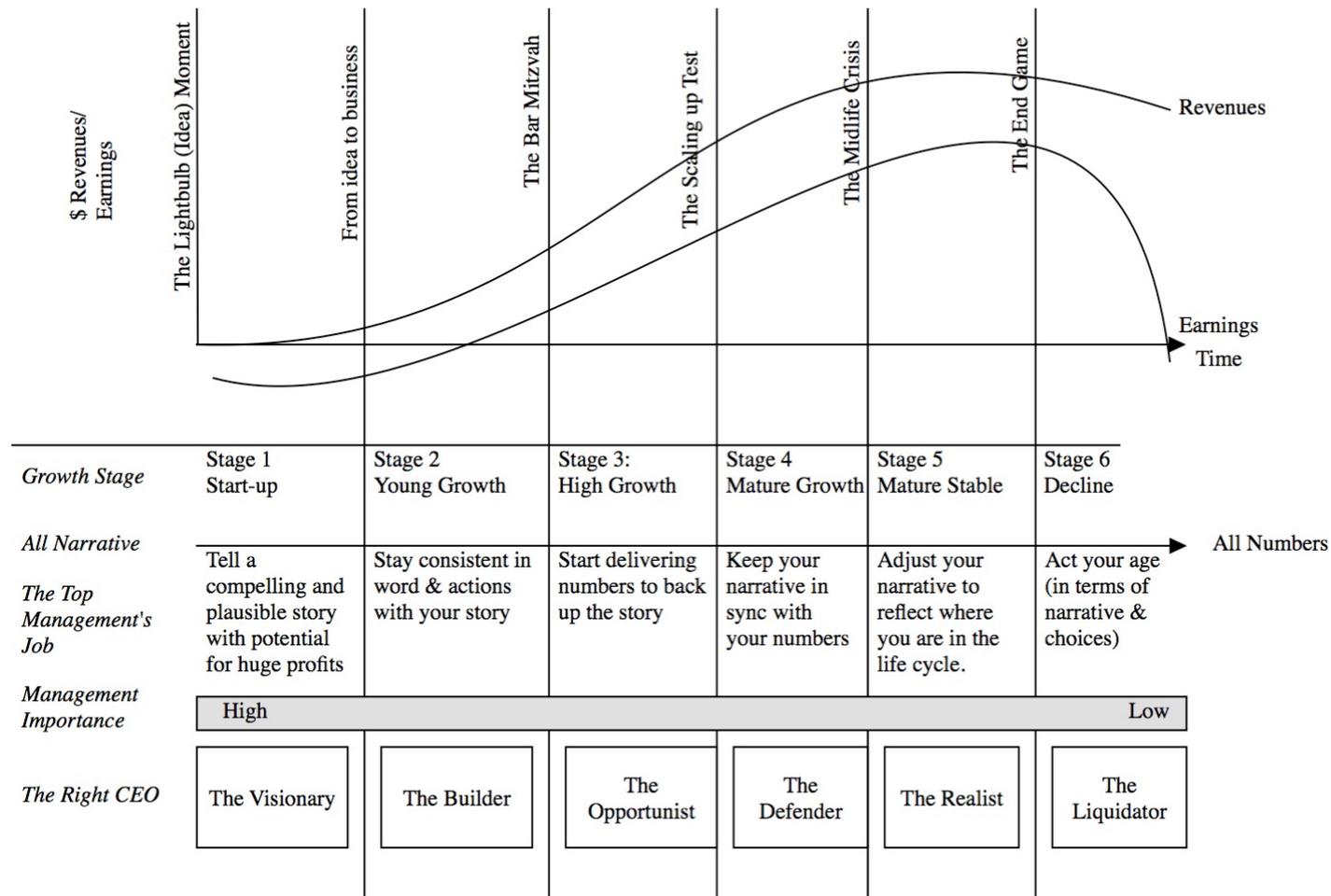
### The Cash Flows

	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		

# THE MANAGERIAL CHALLENGE



# THE COMPRESSED LIFE CYCLE?

## Tech firm life cycle

Tech companies don't have long "mature" periods, where they get to live off the fat, because disruption is always around the corner.

Tech companies are able to climb the growth ladder faster because their growth requires less investment and their products are more likely to be accepted quickly by consumers.

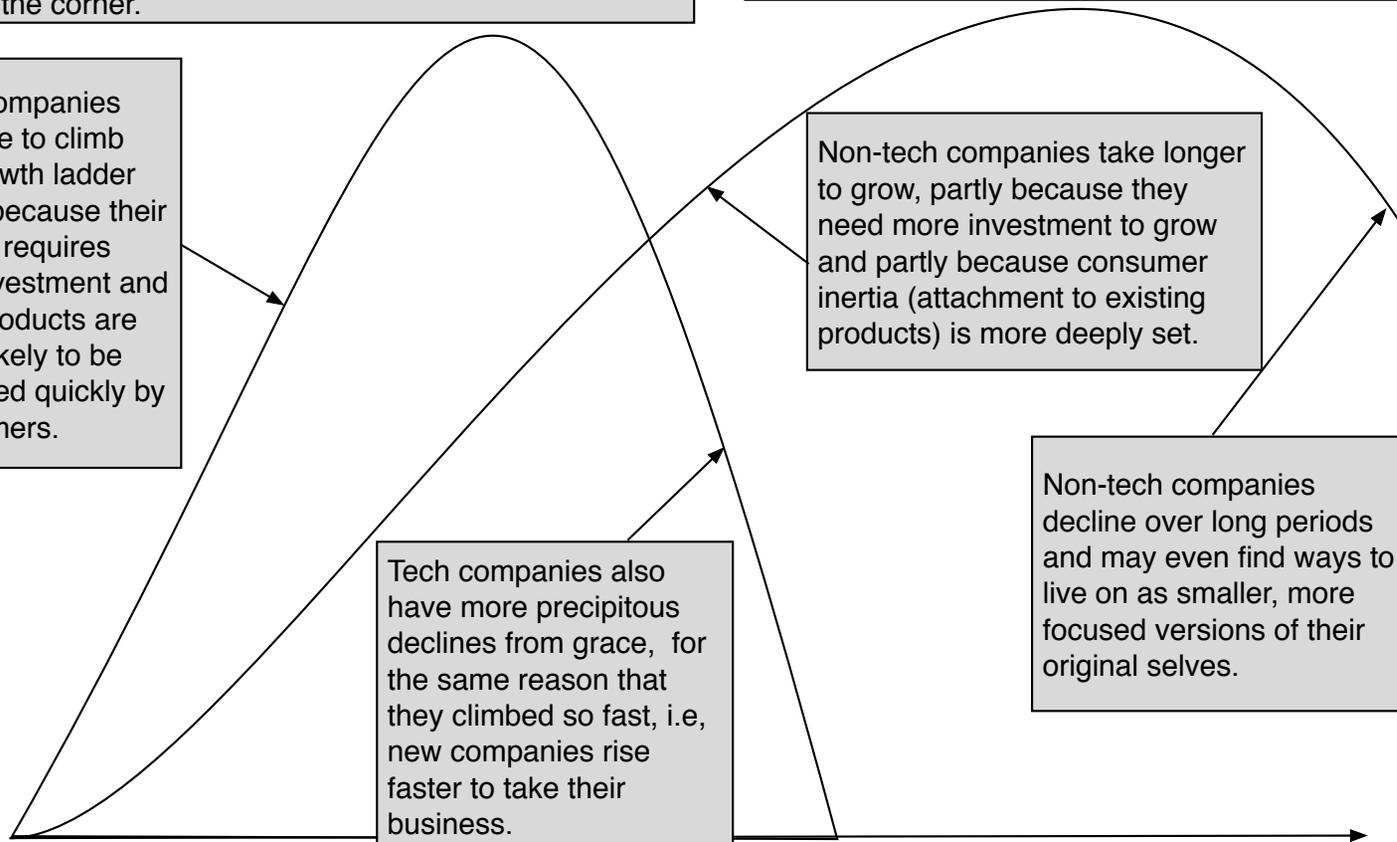
Tech companies also have more precipitous declines from grace, for the same reason that they climbed so fast, i.e., new companies rise faster to take their business.

## Non-tech firm life cycle

Non-tech companies get longer "mature" period, where they get to milk their cash cows.

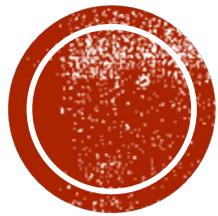
Non-tech companies take longer to grow, partly because they need more investment to grow and partly because consumer inertia (attachment to existing products) is more deeply set.

Non-tech companies decline over long periods and may even find ways to live on as smaller, more focused versions of their original selves.



# 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.



**THE END**

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