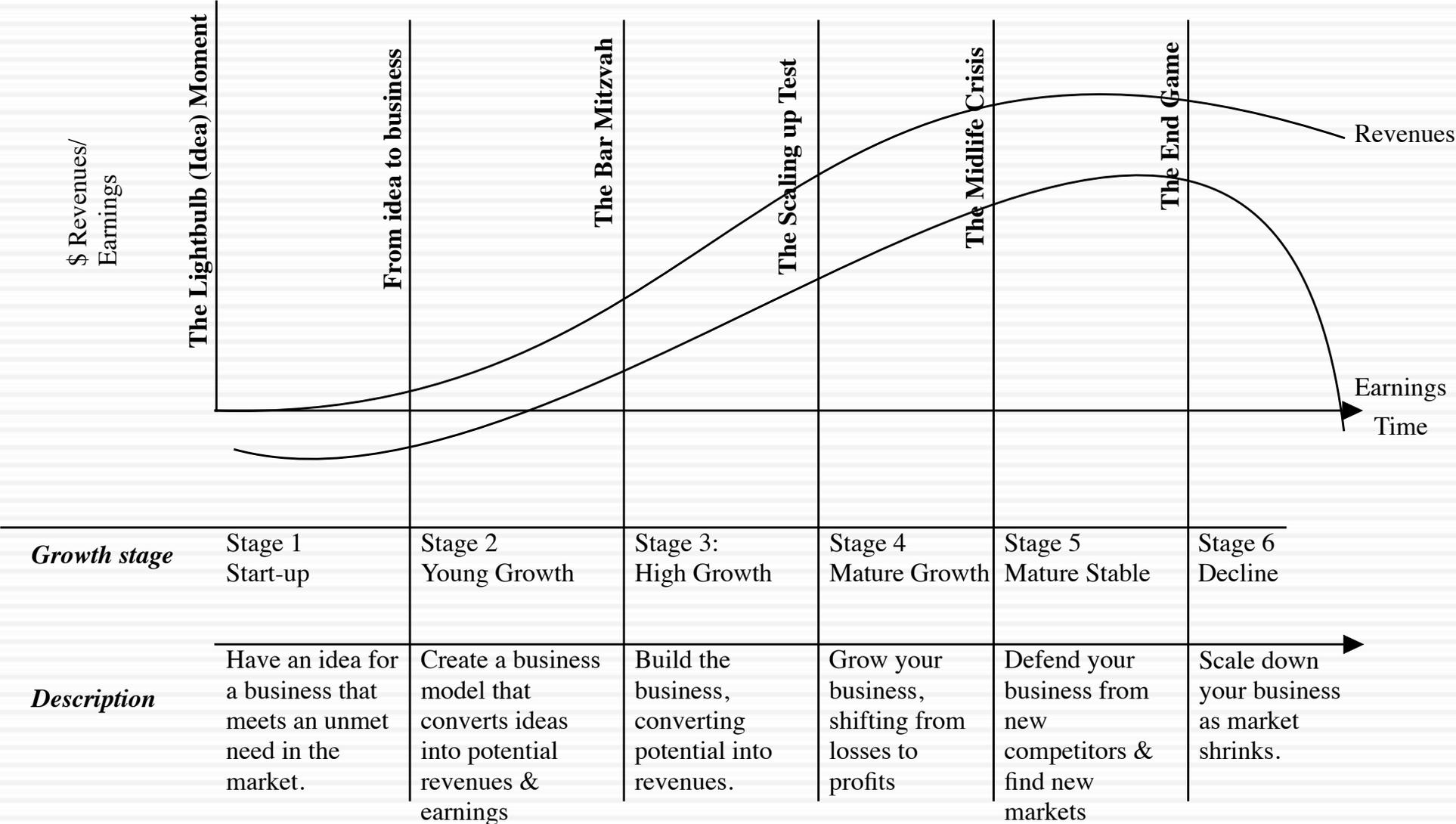


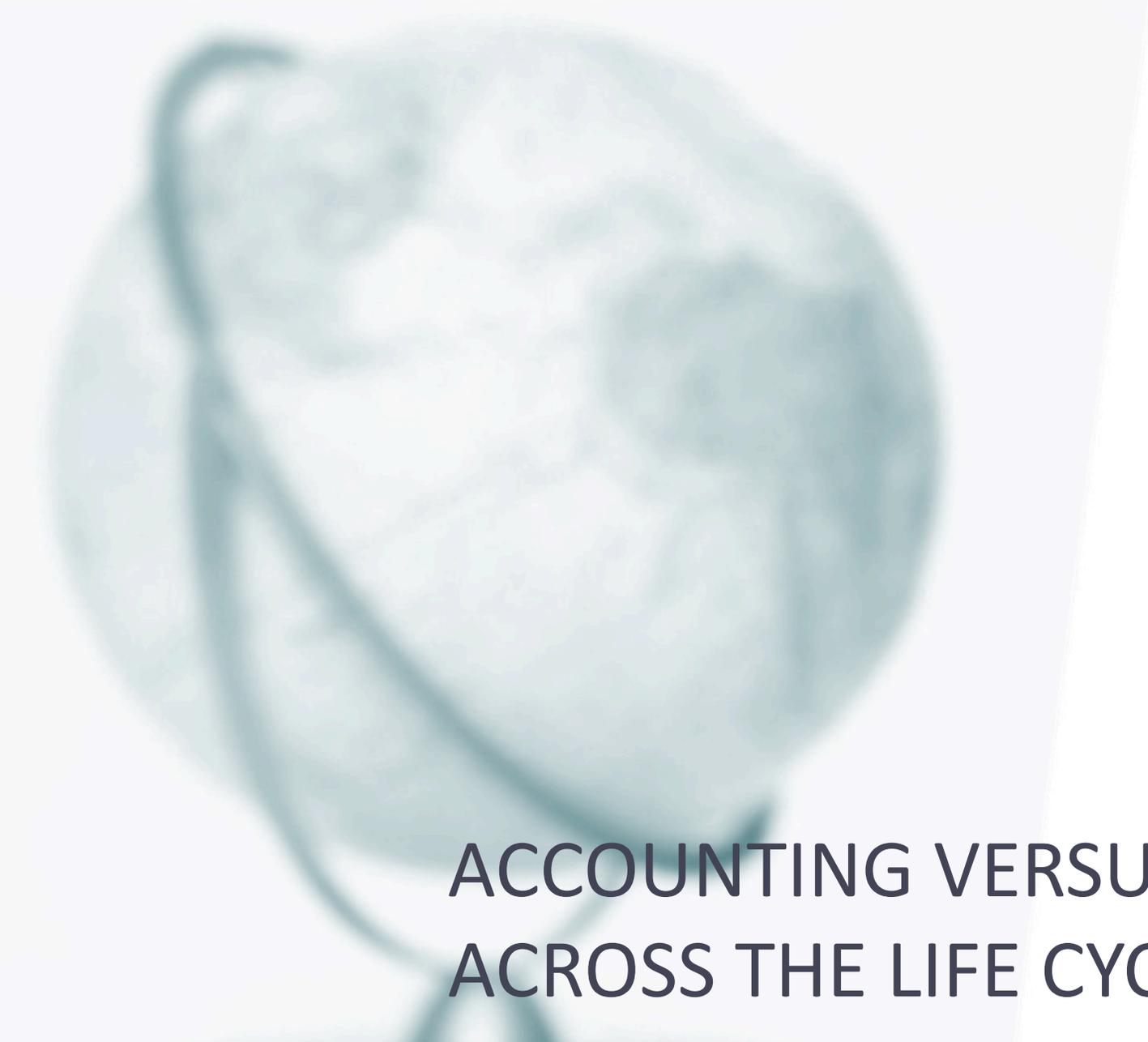


THE CORPORATE LIFE
CYCLE: GROWING UP IS
HARD TO DO!

Aswath Damodaran

The Life Cycle





ACCOUNTING VERSUS FINANCE ACROSS THE LIFE CYCLE



Accounting and Financial Balance Sheets

Accounting Balance Sheet

Assets		Liabilities	
Long Lived Real Assets	Fixed Assets	Current Liabilities	Short-term liabilities of the firm
Short-lived Assets	Current Assets	Debt	Debt obligations of firm
Investments in securities & assets of other firms	Financial Investments	Other Liabilities	Other long-term obligations
Assets which are not physical, like patents & trademarks	Intangible Assets	Equity	Equity investment in firm

A Financial Balance Sheet

Assets		Liabilities	
Existing Investments Generate cashflows today	Investments already made	Debt	Borrowed money
Expected Value that will be created by future investments	Investments yet to be made	Equity	Owner's funds

Variant 1: You estimate the values of assets

Variant 2: You let the market estimate it for you

An Early Stage Comparison - Twitter

Accounting Balance Sheet

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

Intrinsic Value Balance Sheet (post-IPO)

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

Market Price Balance Sheet (post-IPO)

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

A More Mature Company: Ferrari

Accounting Balance Sheet

Cash	164	Debt	623
Other current asset	3,131	Minority Interest	13
PP&E	591	Other liabilities	1,894
Financial Inv	216	Equity	2,474
Goodwill	781		
Other Intangibles	278		
Total Assets	5,004		

Intrinsic Value Balance Sheet

Cash	164	Debt	623
Assets in Place	5,489	Minority Interest	13
Growth Assets	658	Equity	6,311

Market Price Balance Sheet

Cash	164	Debt	623
Assets in Place	5,489	Minority Interest	13
Growth Assets	5,347	Equity	11,000

Infosys: Balance Sheet in March 2018

Particulars	Note	As at March 31,		As at April 1,
		2017	2016	2015
ASSETS				
Non-current assets				
Property, plant and equipment	2.4	9,751	8,637	7,685
Capital work-in-progress		1,365	960	776
Goodwill	2.5	3,652	3,764	3,091
Other intangible assets	2.5	776	985	638
Investment in associate	2.25	71	103	93
Financial assets				
Investments	2.6	6,382	1,714	1,305
Loans	2.7	29	25	31
Other financial assets	2.8	309	286	173
Deferred tax assets (net)	2.17	540	536	536
Income tax assets (net)	2.17	5,716	5,230	4,089
Other non-current assets	2.11	1,059	1,357	698
Total non-current assets		29,650	23,597	19,115
Current assets				
Financial assets				
Investments	2.6	9,970	75	874
Trade receivables	2.9	12,322	11,330	9,713
Cash and cash equivalents	2.10	22,625	32,697	30,367
Loans	2.7	272	303	222
Other financial assets	2.8	5,980	5,190	4,527
Other current assets	2.11	2,536	2,158	1,541
Total current assets		53,705	51,753	47,244
Total assets		83,355	75,350	66,359
EQUITY AND LIABILITIES				
Equity				
Equity share capital	2.13	1,144	1,144	572
Other equity		67,838	60,600	54,198
Total equity attributable to equity holders of the Company		68,982	61,744	54,770
Non-controlling interests		—	—	—
Total equity		68,982	61,744	54,770
Liabilities				
Non-current liabilities				
Financial liabilities				
Other financial liabilities	2.14	70	69	—
Deferred tax liabilities (net)	2.17	207	252	159
Other non-current liabilities	2.15	83	46	47
Total non-current liabilities		360	367	206
Current liabilities				
Financial liabilities				
Trade payables		367	386	140
Other financial liabilities	2.14	6,349	6,302	5,983
Other current liabilities	2.15	3,007	2,629	1,964
Provisions	2.16	405	512	478
Income tax liabilities (net)	2.17	3,885	3,410	2,818
Total current liabilities		14,013	13,239	11,383
Total equity and liabilities		83,355	75,350	66,359

Infosys: Financial Balance Sheet

8

	Value		Value
Assets in Place	₹ 167,961	Debt	₹ -
Growth Assets	₹ 47,751	Equity	₹ 244,893
Cash & Non-operating Assets	₹ 29,181		

The Bottom Line

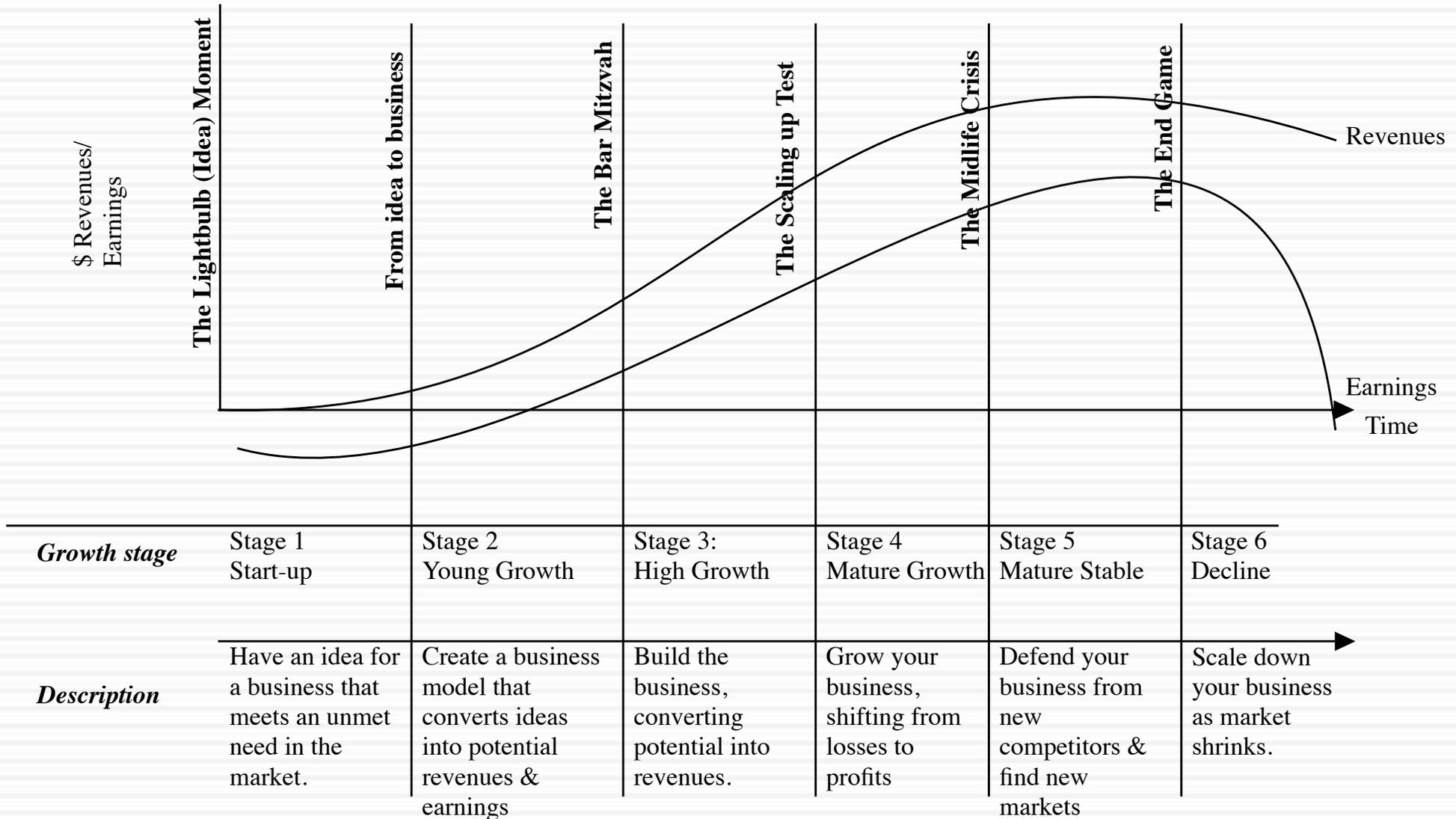
- Accounting statements get less and less useful if you are looking earlier in the life cycle, since accountants have neither a history to record nor an operating business to describe.
- As companies age, balance sheets mean more but they also become more cluttered, since they carry the legacy of “accounting” fixes and choices. Meaningless assets start to populate the balance sheet and meaningless liabilities are often created to offset them.
- Balance sheet based valuation, which is what most accounting valuation is (and is at the core of much of value investing) is useless with young companies. It is most useful in mature companies without accounting clutter.
- For companies where accounting miscategorizes expenses, balance sheets get even more meaningless.
- Fair value accounting is destined for failure everywhere, because accountants cannot be imaginative and/or creative, but it will fail most spectacularly with young companies.



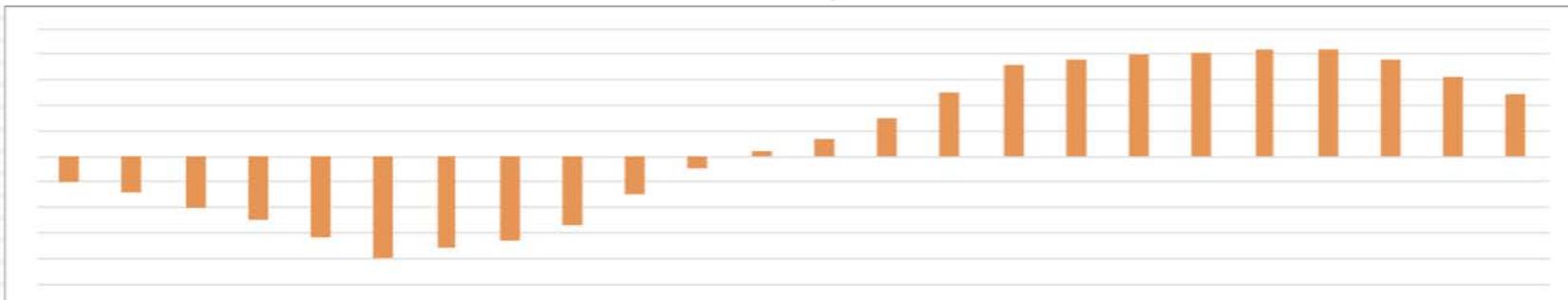
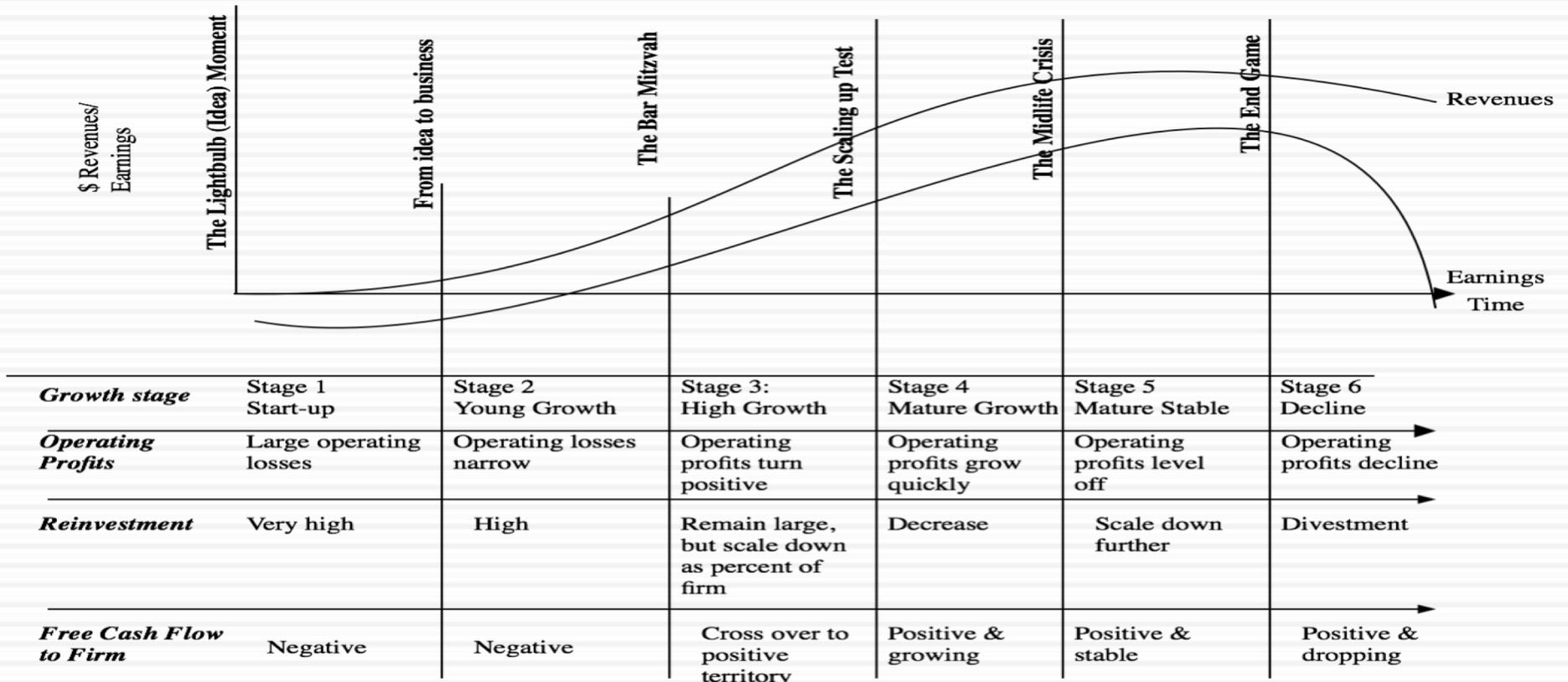
CORPORATE LIFE CYCLE: THE DETERMINANTS



Revisiting the Life Cycle



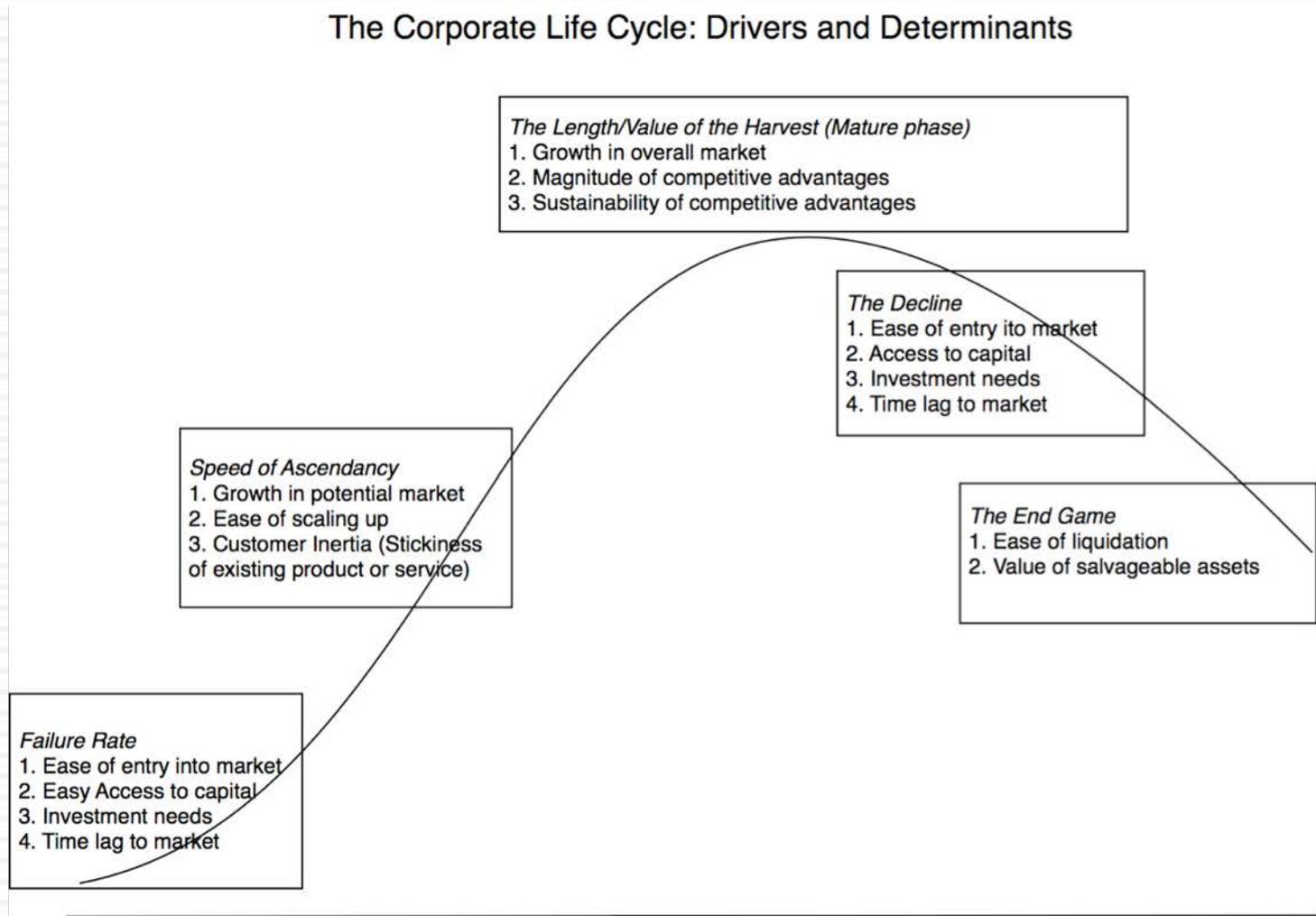
The Life Cycle in earnings and cash flows



Would you rather be young or old?

- As a business, where in the life cycle would you most like to be?
 - a. A Start up
 - b. A Young, Growth Company
 - c. An Established Growth Company
 - d. A Mature Growth Company
 - e. A Mature Company
 - f. A Declining Company
- Assuming you are a business, where in the life cycle are you currently?
 - a. A Start up
 - b. A Young, Growth Company
 - c. An Established Growth Company
 - d. A Mature Growth Company
 - e. A Mature Company
 - f. A Declining Company

The determinants of the life cycle



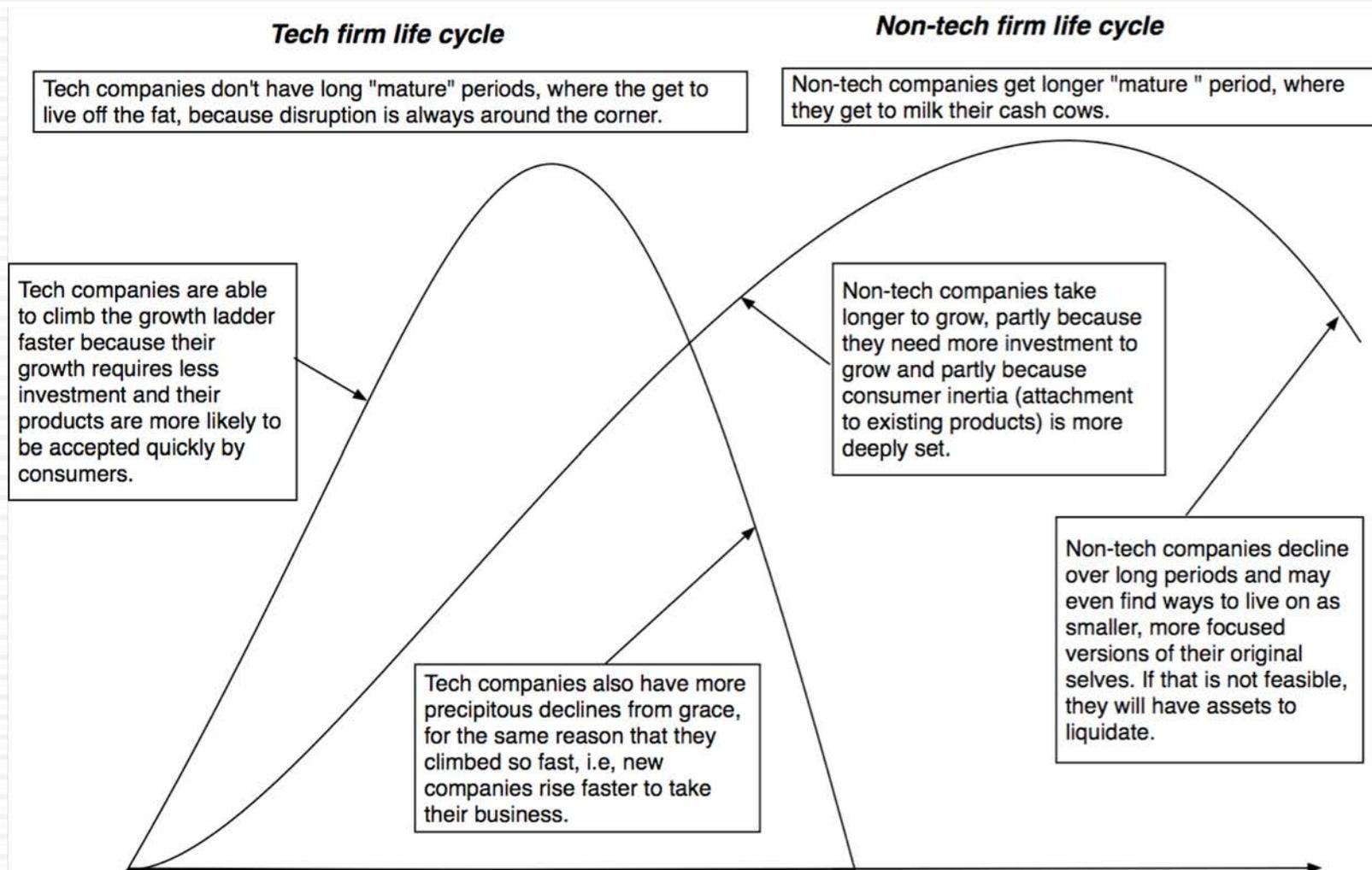
Tech versus Non-tech companies

- Drawing the line between tech and non tech companies is getting more and more difficult. The solution may be to think of technology on a continuum.
- There are two reasons the classifications matter:
 - Equity research analysts and portfolio managers still work in sector silos, with tunnel vision of anything that happens outside these silos. Where a company like Amazon is placed can make a difference in how it is analyzed.
 - Pricing is often done relative to the sector that investors decide to put a company into.

The defining characteristics of the tech business..

1. Scaling up is easy: Tech companies often operate in businesses where entry is not restricted, the up front investment is minimal and scaling up is easy.
2. Holding on is tough: Once tech companies reach the mature phase, they don't get to have long harvest periods. Their competitive advantages are fleeting and quickly deplete.
3. Decline is rapid: The same forces that allow technology companies to grow, i.e., unrestricted entry, ease of scaling up and customer switching, also make them vulnerable to new entrants seeking to take their business away from them.
4. And there is little left in the end game: Unlike other businesses, which accumulate physical assets as they grow and thus have a liquidation potential, with technology companies, there is little of substance to fall back, once earnings power is exhausted.

Tech versus Non-tech life cycles

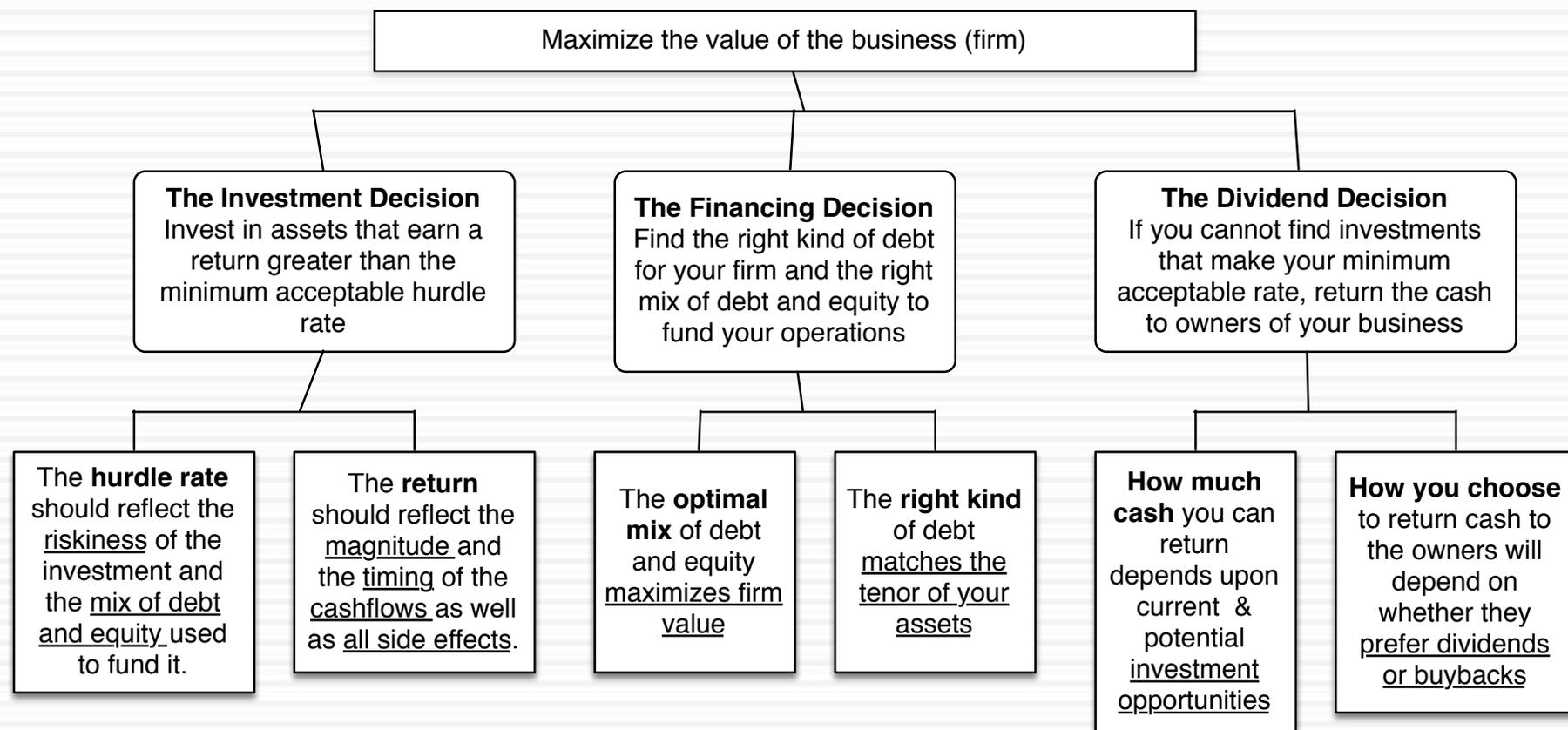




CORPORATE FINANCE ACROSS THE LIFE CYCLE

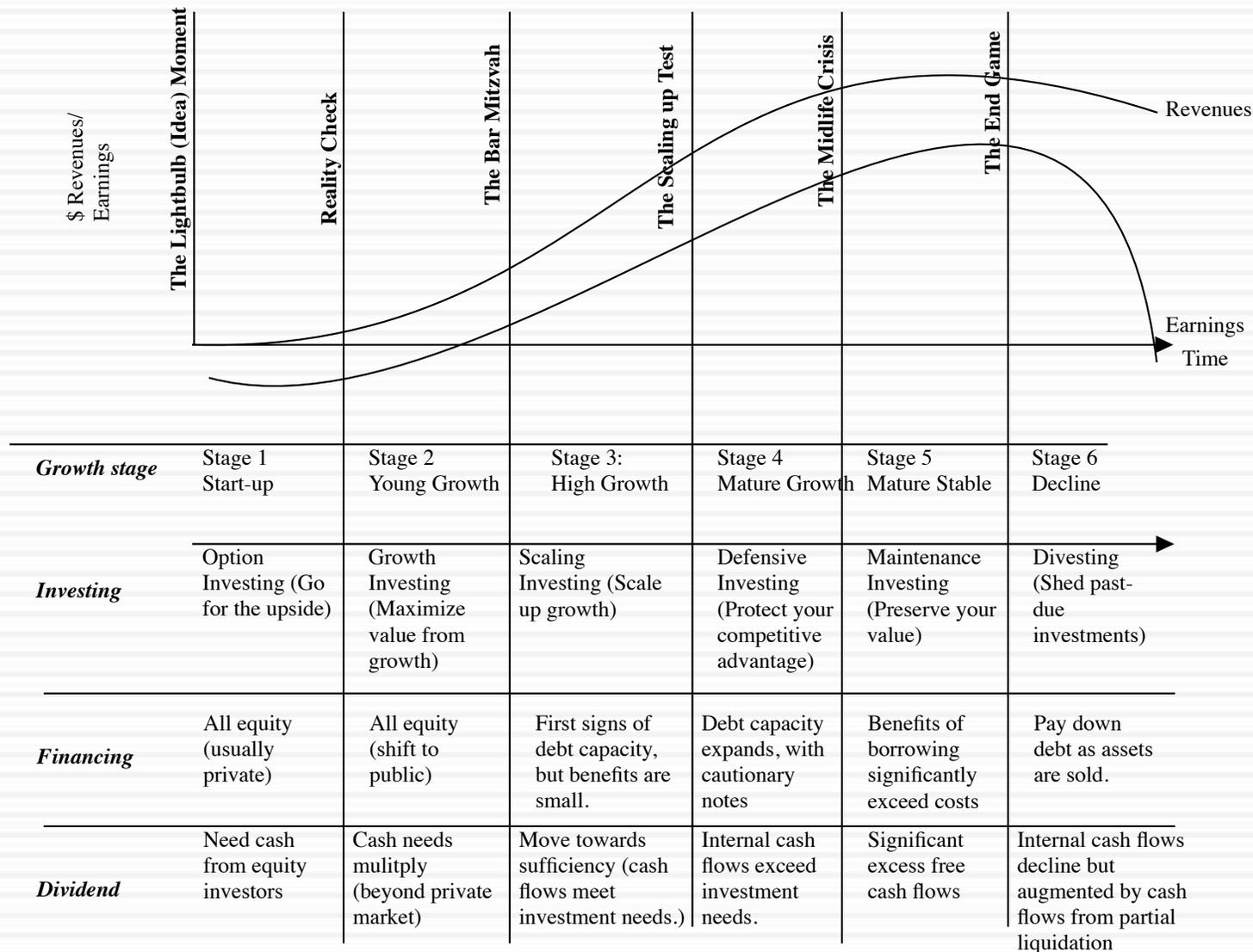


The Big Picture

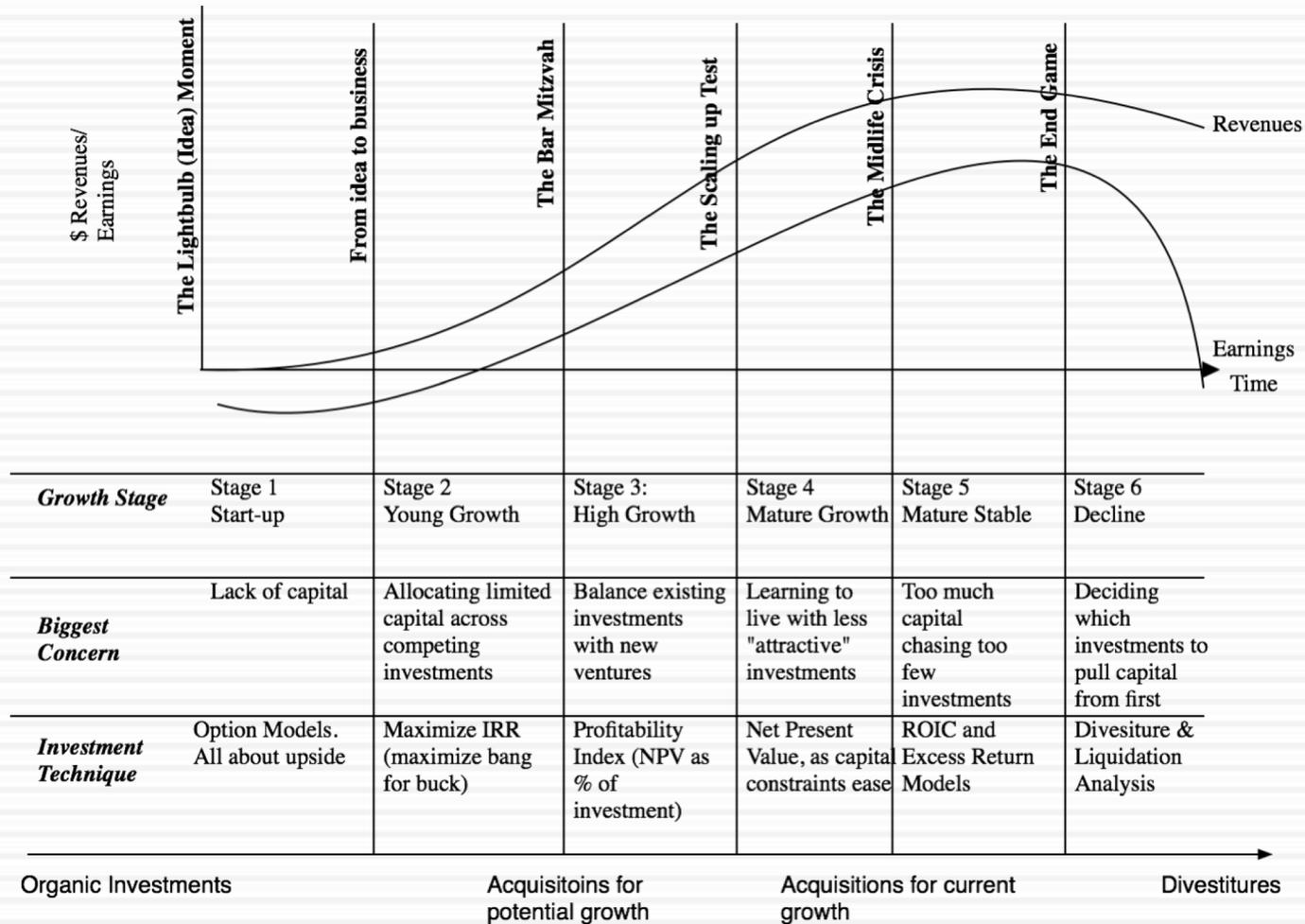


The Emphasis Shifts

The Corporate Life Cycle

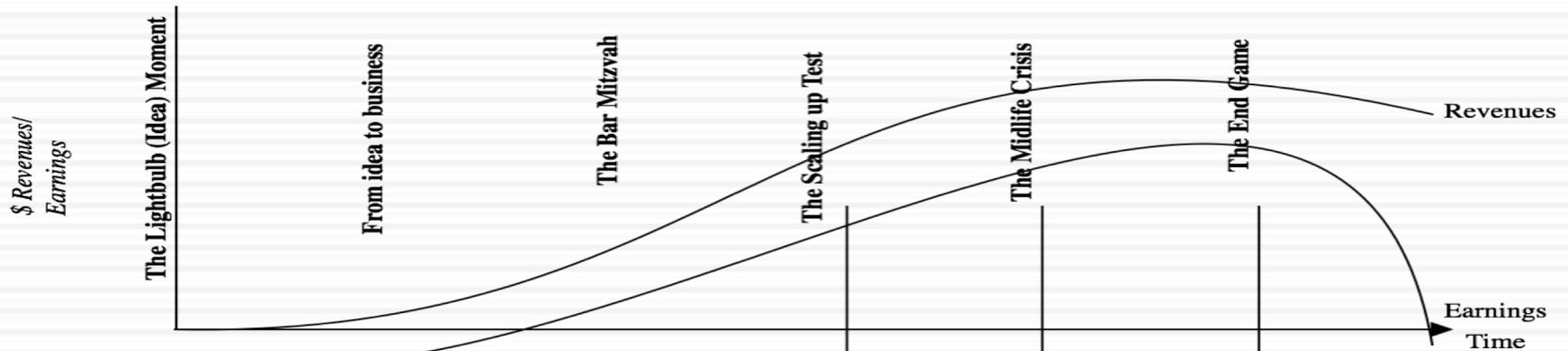


Too many projects to too few..



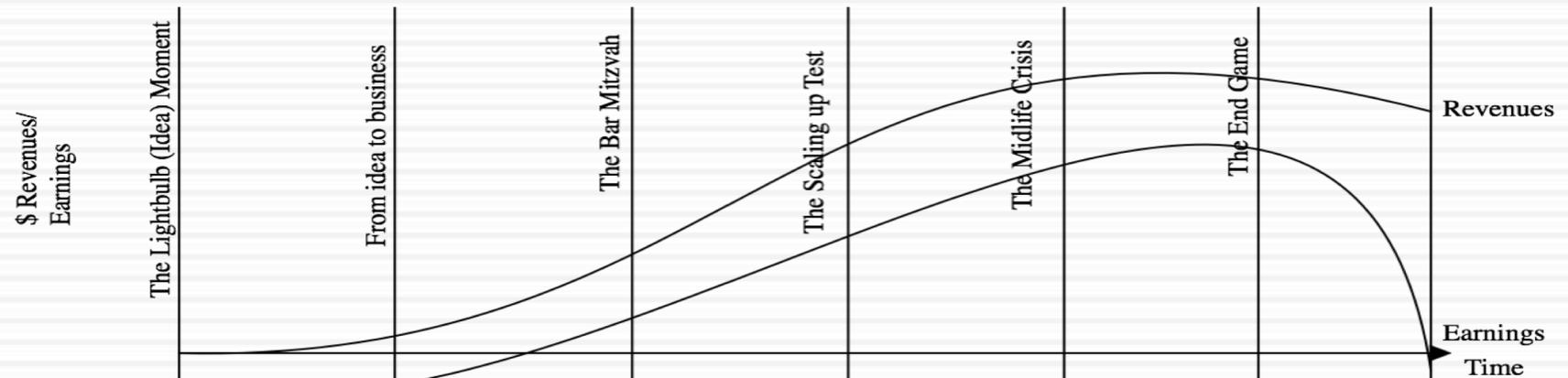
And with it, debt capacity

Debt Capacity across Life Cycle



<i>Growth stage</i>	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
<i>Profits & Cash Flows</i>	Large losses & negative cashflows	Losses narrow but cashflows still negative	Profits turn positive but reinvestment needs make cashflows low/negative	Cash flows turn positive, as profits grow & reinvestment drops	Cashflows continue to rise, as earnings stabilize	Operating profits decline but divestitures add to cashflow
<i>Tax Benefits</i>	None	None	Low, as NOLS shelter income	Rising, as NOLs expire	High	Positive, but dropping
<i>Expected Bankruptcy Costs</i>	Very high, since earnings are negative	Very high, as probability of default still stays high.	High, as costs of bankruptcy (indirect) rise.	Dropping, as earnings grow and bankruptcy cost drops	Lower, as earnings become more predictable	Manageable, if debt scales down as firm gets smaller
<i>Debt Capacity</i>	Non-existent	Very low	Low	Rising	High	High, but dropping

Dividends, from seed to harvest..



<i>Growth Stage</i>	<i>Stage 1 Start-up</i>	<i>Stage 2 Young Growth</i>	<i>Stage 3: High Growth</i>	<i>Stage 4 Mature Growth</i>	<i>Stage 5 Mature Stable</i>	<i>Stage 6 Decline</i>
<i>Operating Cashflow to Equity</i>	Negative	Negative	Small +ve -> Big Positive	Big, growing Positive	Big, stable Positive	Declining
<i>Reinvestment</i>	High	High	High, but dropping	High, approaching average	Low	Negative (Divesting)
<i>Debt</i>	No debt	No debt	Low debt	Medium debt	High debt	Retiring debt
<i>Potential Dividend (FCFE)</i>	Negative FCFE	Negative FCFE	Negative -> Low +ve FCFE	Positive & growing FCFE	Positive & stable FCFE	Positive & dropping FCFE
<i>Regular Dividends</i>	No. Don't have cash flow	No. Don't have cash flow	No. Cash flow is too uncertain.	Initiate, but keep low.	Sweet spot. Big & stable	Shrinking Dividends
<i>Special Dividends/ Buybacks</i>	No. Don't have cash flow	No. Don't have cash flow	Perhaps, if you have a good year	Sweet Spot. Big & recurrent.	Supplement in good years	Liquidating Dividends

The Bottom Line

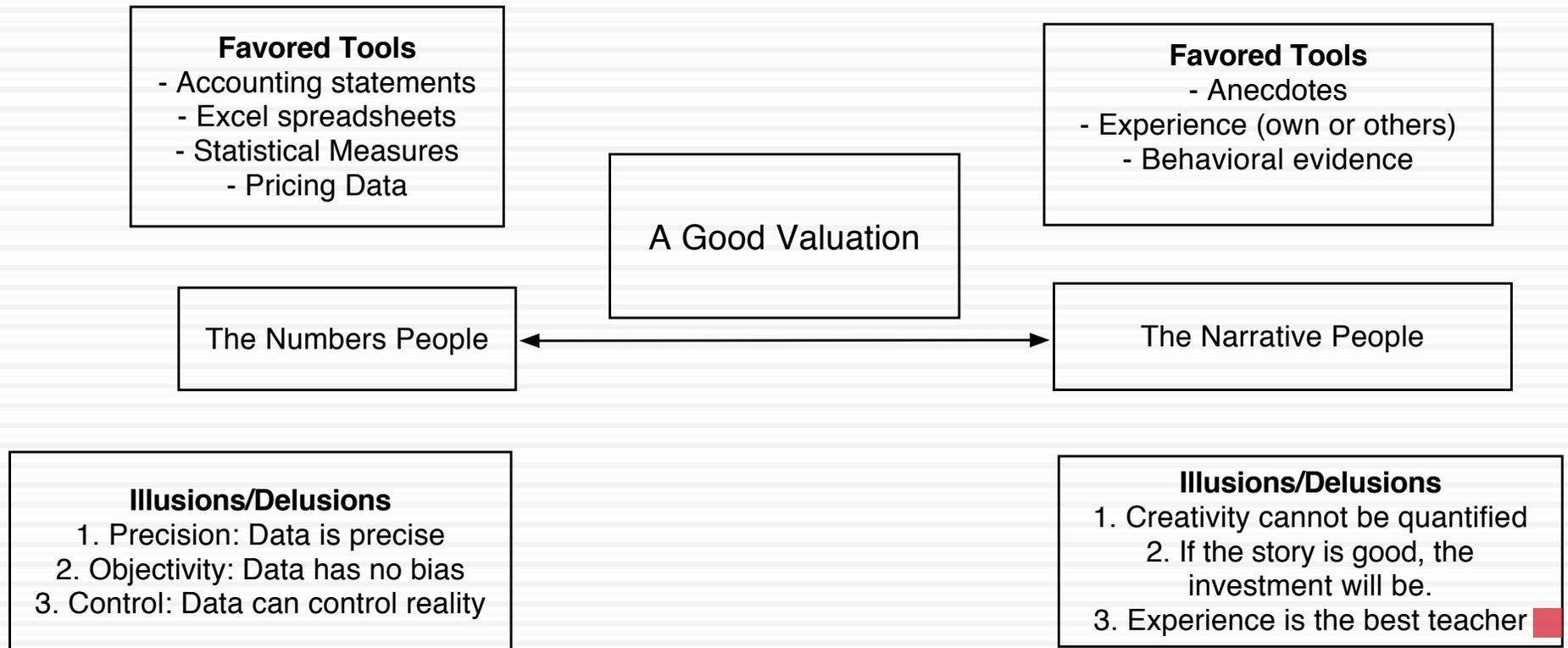
- Early in the life of a business, it is the creative part of the business (R&D, New Product development) that will drive the business, since value is created primarily from making great investments.
- As a business ages, you will see power shift towards the “finance” portion of the business, as projects start to get less attractive and financial engineering (changing debt mixes, debt types) will start to be potentially more value creating.
- As the business enters its declining phase, it will be decisions about how much to return to owners and in what form that will become the core discussion.
- By observing what a company is focusing its energies on, you can usually get a sense of where it thinks it is in the life cycle.
- Companies that don't “act their age” will destroy value, in one way or the other.



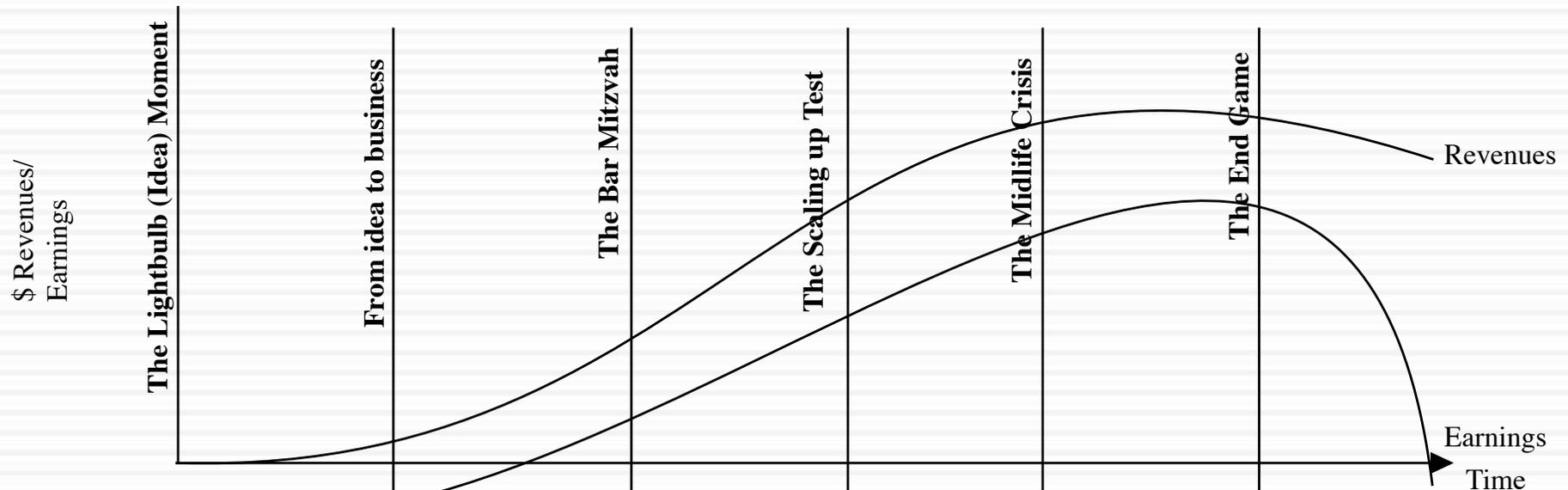
FROM NARRATIVE TO NUMBERS

All story to mostly numbers..

Valuation as a bridge



Narrative versus Numbers



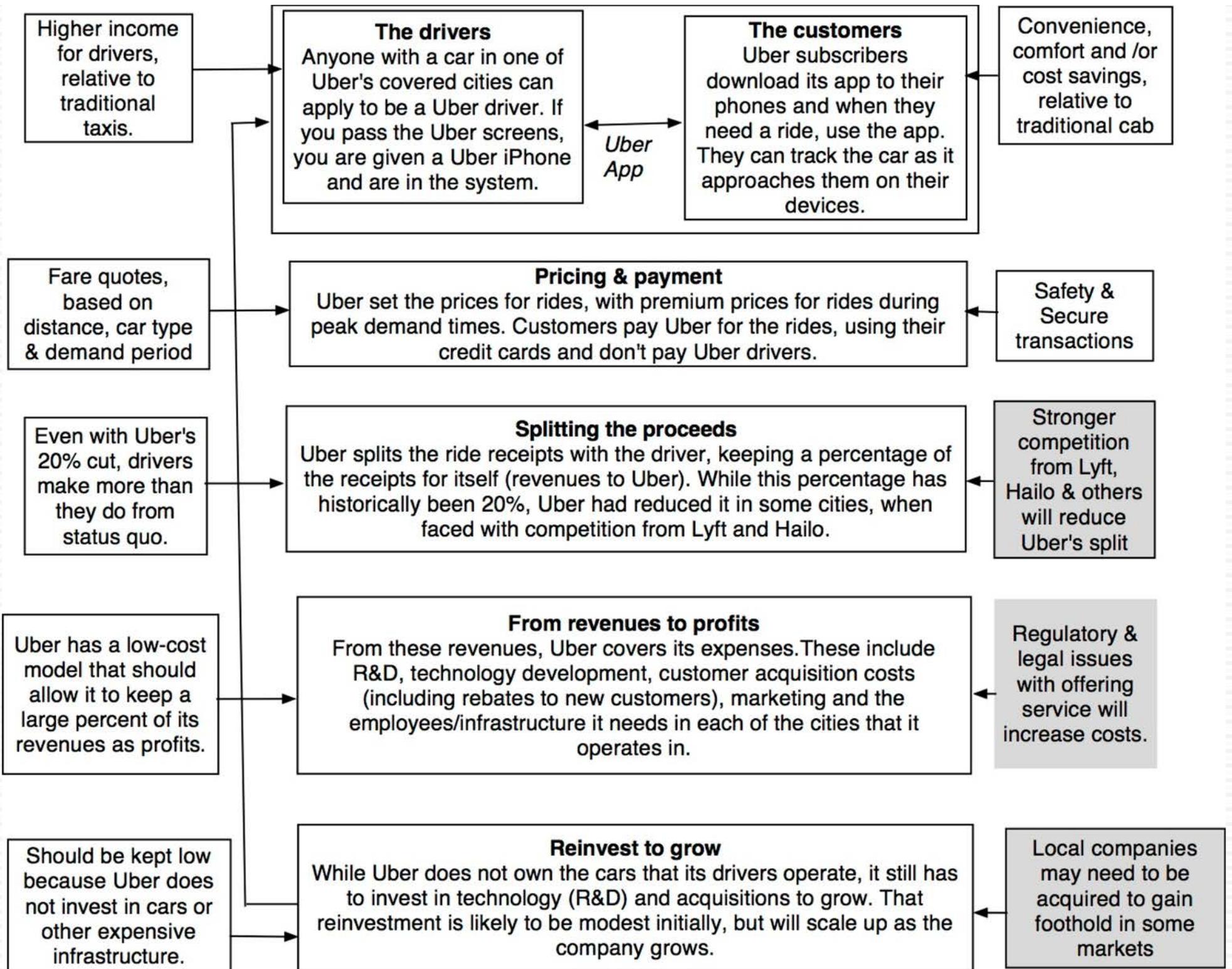
Growth stage	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
All Narrative	→ All Numbers					
Narrative drivers	How big is the narrative?	How plausible is the narrative?	How profitable is the narrative?	How scalable is the narrative?	How sustainable is the narrative?	Is there a happy ending?

Narrative to Numbers for companies

- With a young company, narrative is central, divergent and volatile.
 - ▣ It is central because it is the only thing that you are offering investors, since you have no history.
 - ▣ It is divergent because you can still offer widely different narratives, since it is early in the game.
 - ▣ It is volatile, because the real world will deliver surprises that will require you to adjust your narrative.
- As companies age, their narratives get narrower as their histories, size and culture start to become binding. The numbers often drive the narrative, rather than the other way around.

Step 1: Survey the landscape

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



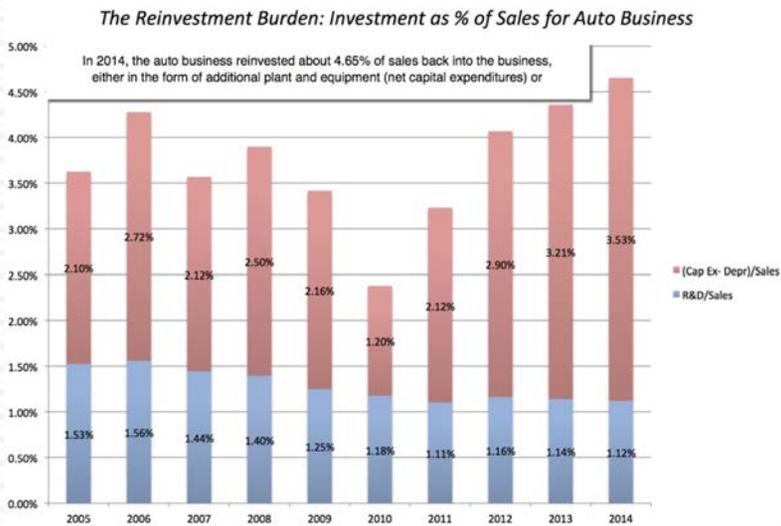
The Auto Business

Anemic Revenue Growth

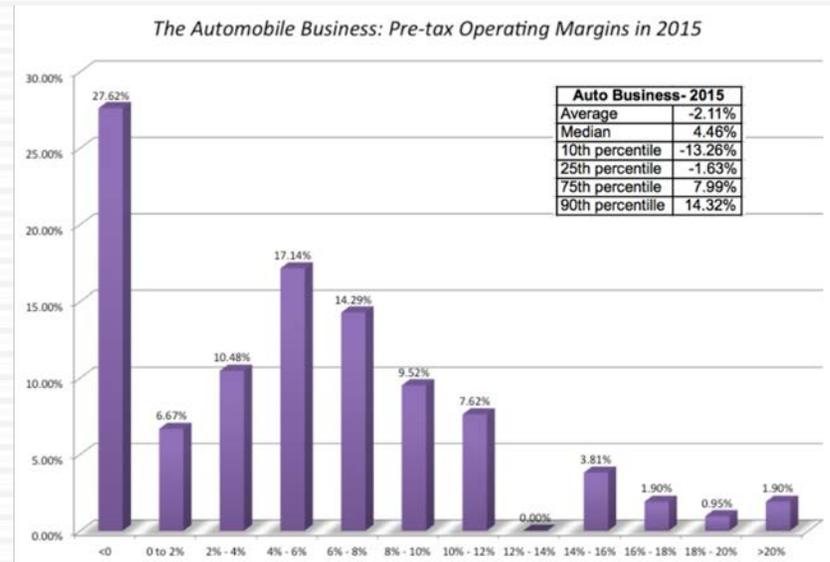
Year	Revenues (\$)	% Growth Rate
2005	1,274,716.6	
2006	1,421,804.2	11.54%
2007	1,854,576.4	30.44%
2008	1,818,533.0	-1.94%
2009	1,572,890.1	-13.51%
2010	1,816,269.4	15.47%
2011	1,962,630.4	8.06%
2012	2,110,572.2	7.54%
2013	2,158,603.0	2.28%
2014	2,086,124.8	-3.36%

Compounded annual revenue growth of 5.63% between 2005 and 2014.

+ Increasing Reinvestment



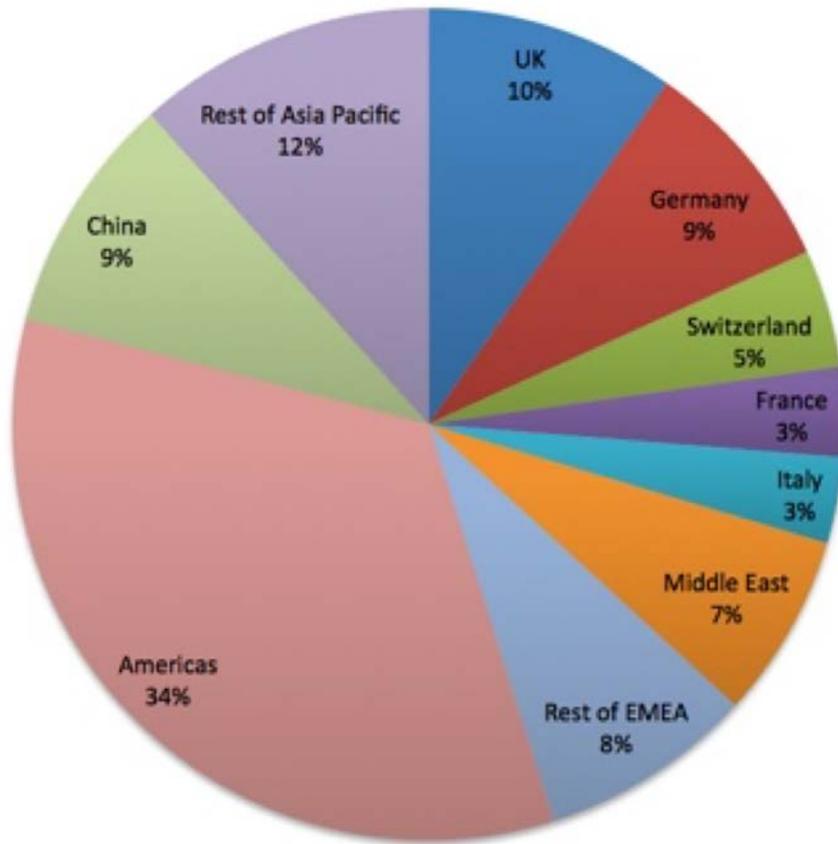
+ Poor Operating Margins



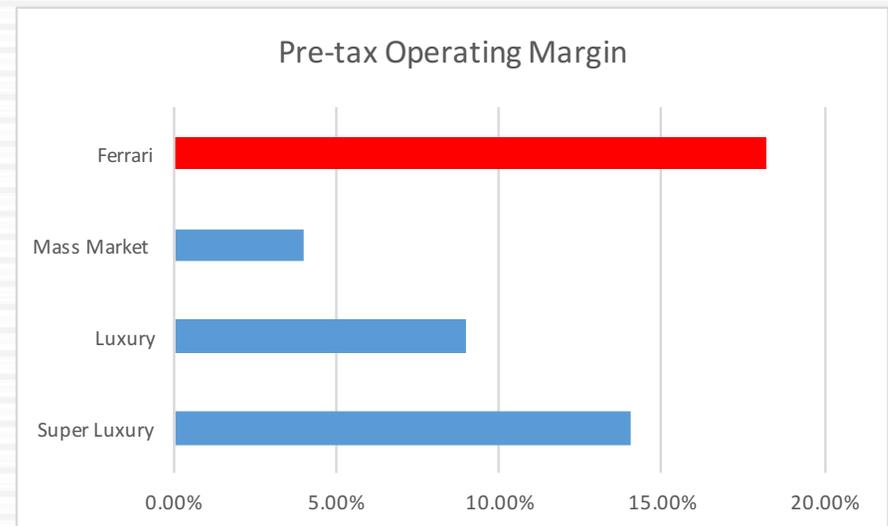
= Bad Business

But super luxury cars look better..

Ferrari: Geographical Sales (2014)



Pre-tax Operating Margin



Step 2: Create a narrative for the future

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

The Uber Narrative

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

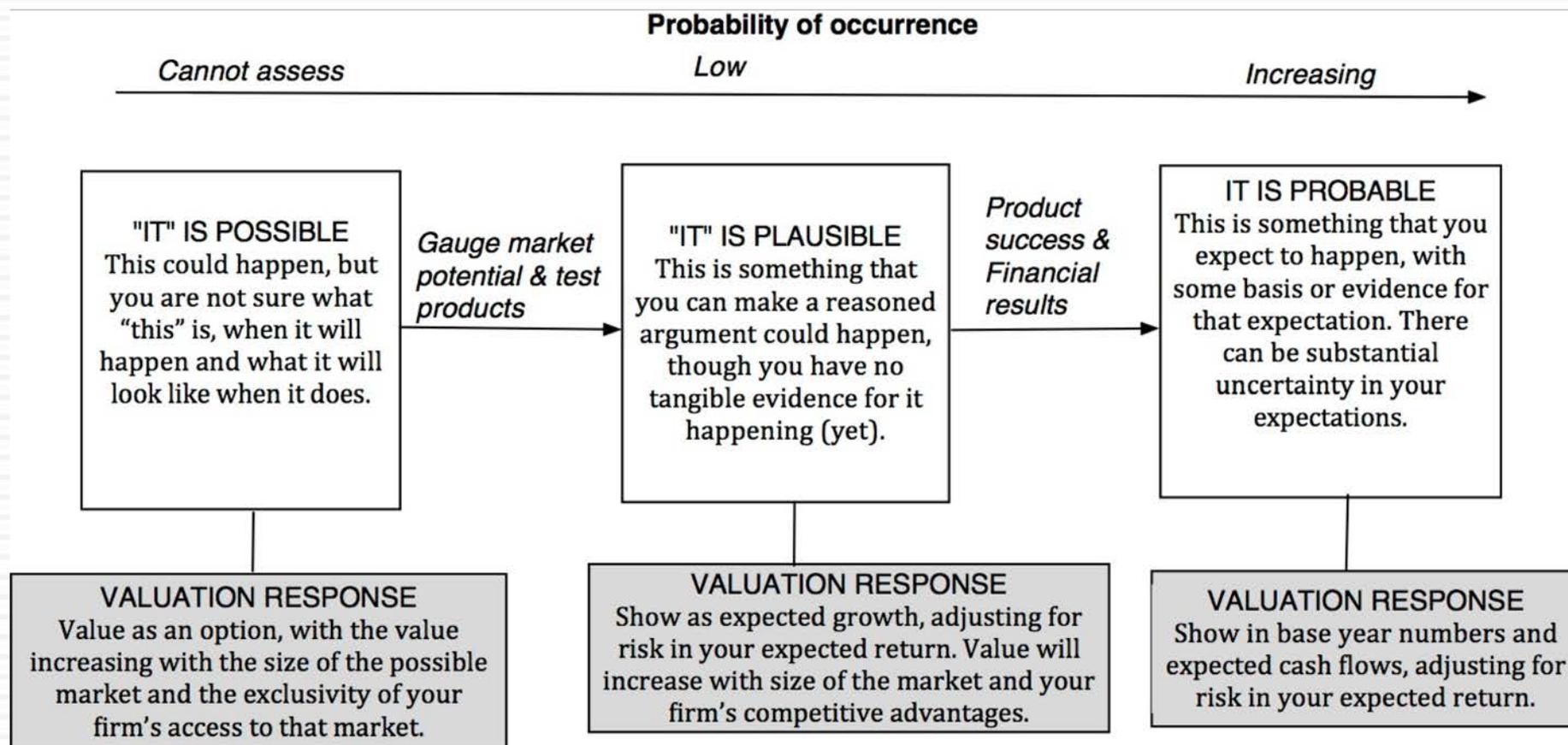
1. An urban car service business: I saw Uber primarily as a force in urban areas and only in the car service business.
2. Which would expand the business moderately (about 40% over ten years) by bringing in new users.
3. With local networking benefits: If Uber becomes large enough in any city, it will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

The Ferrari Narrative

- After the IPO, Ferrari will continue to be run by the same managers who run it today and will continue to be controlled by the Agnelli family and Ferrari (just as it is now).
- In my base narrative, I expect the company to stick to the status quo and
 - ▣ Stay super exclusive (Ferrari's sales have been flat over much of the last decade) and global.
 - ▣ Charge exceptionally high prices
 - ▣ Spend little or nothing on advertising
 - ▣ Be only lightly affected by economic ups and downs (since these are the super rich)

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

37

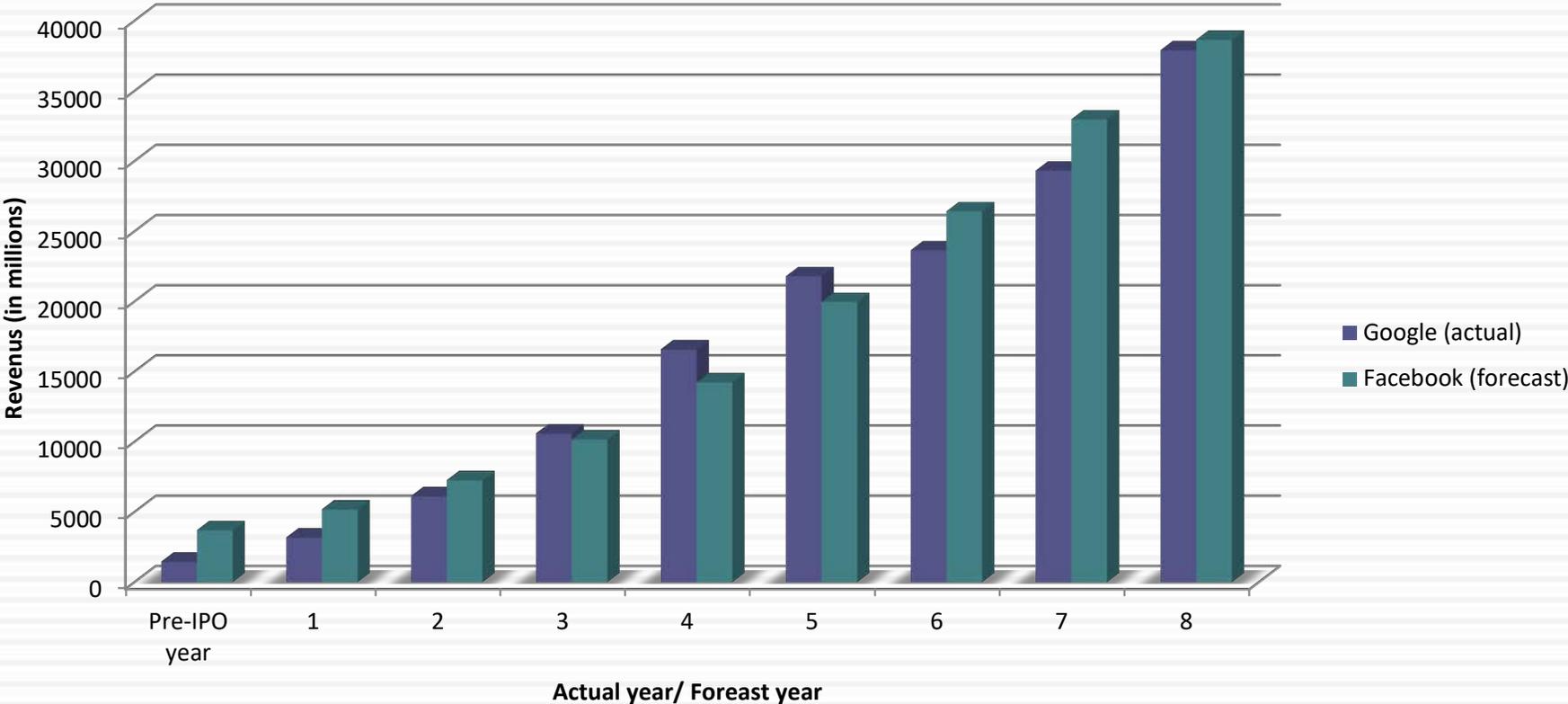


Test 1: The “Big Market” Delusion

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

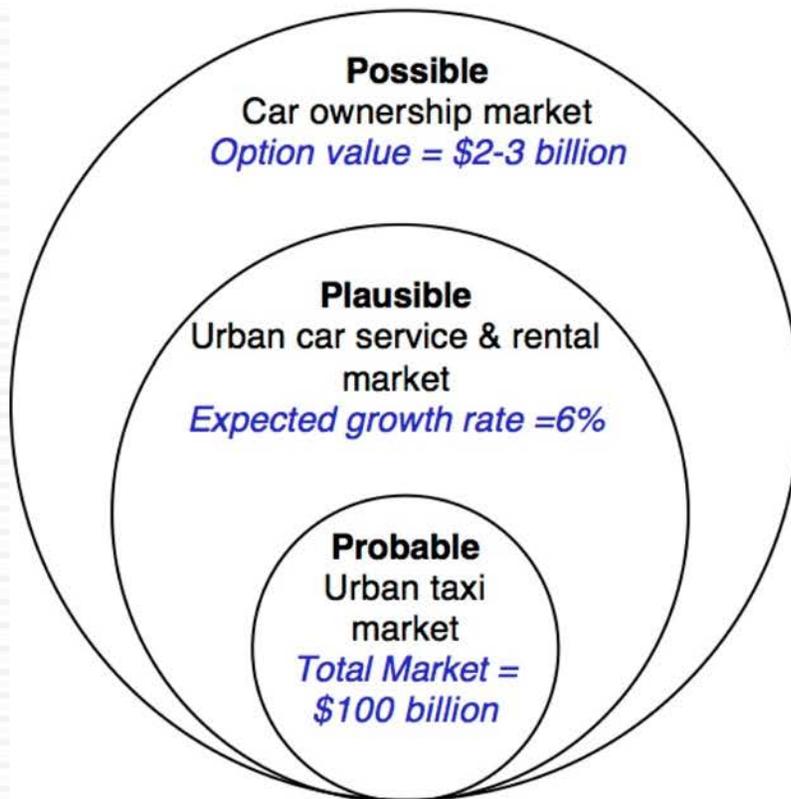
Test 2: Measure up against past winners

Google's actual revenues versus Facebook Revenue Forecasts (at IPO)

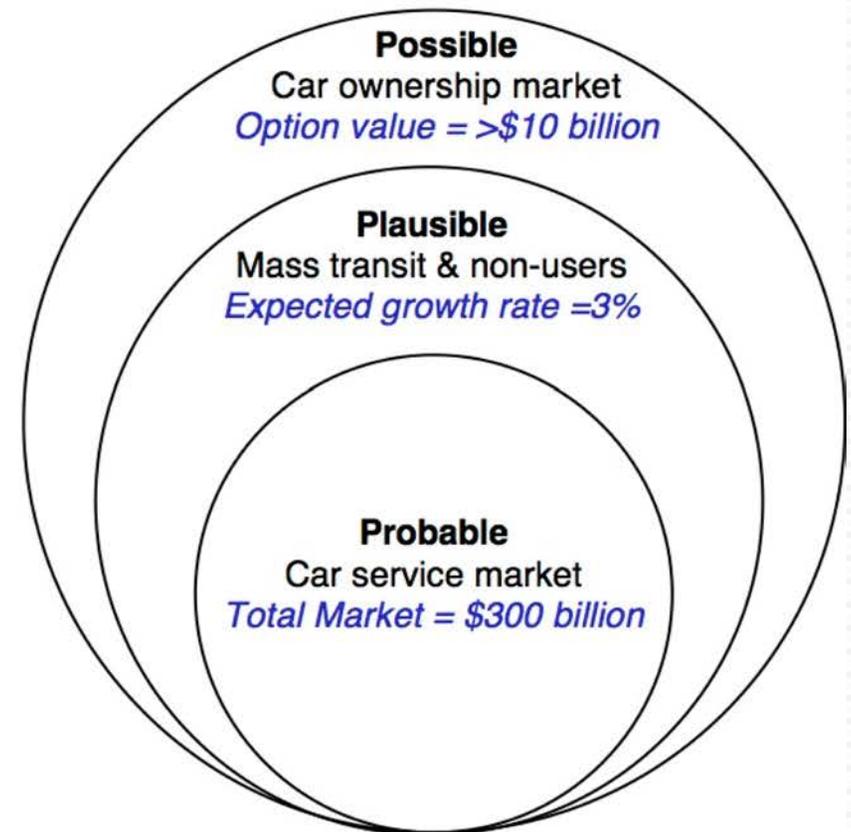


Uber: Possible, Plausible and Probable

Uber (My valuation))



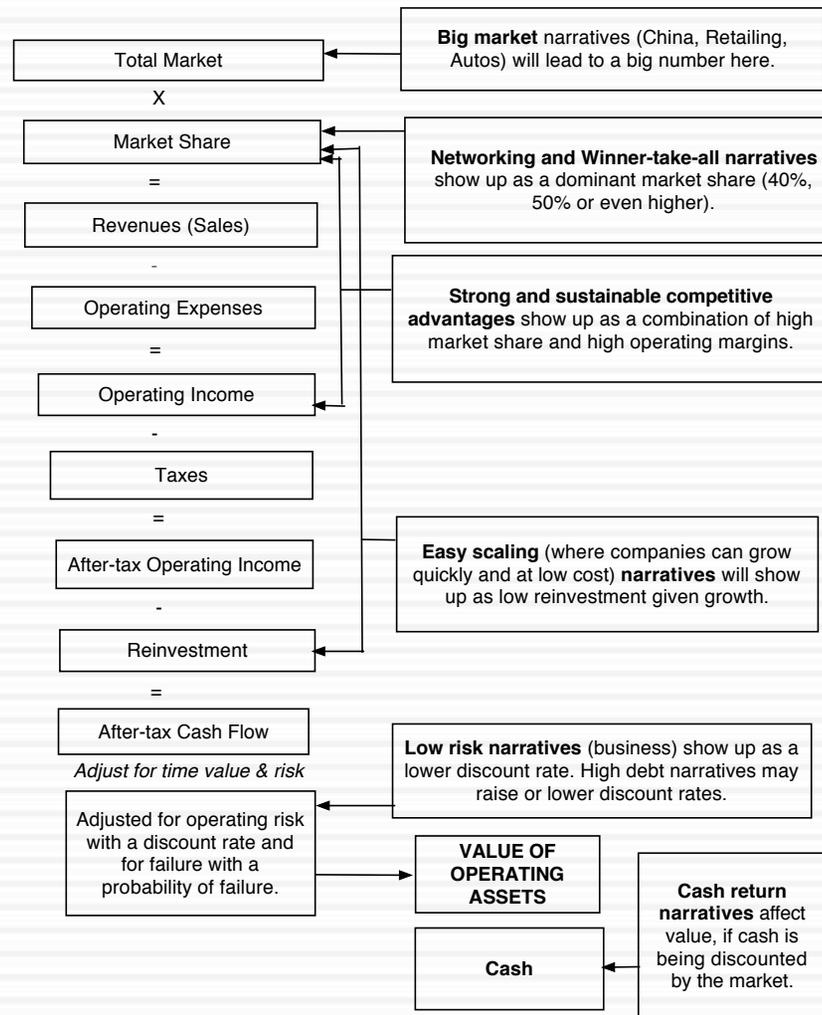
Uber (Bill Gurley)



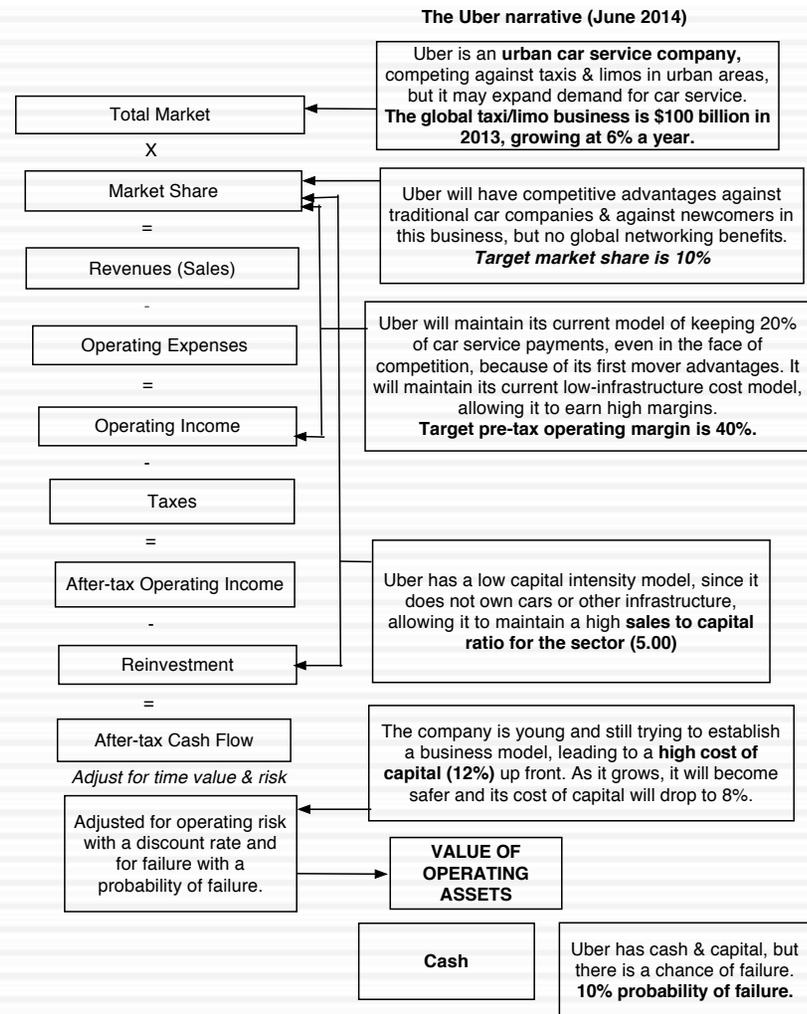
Ferrari: Probable, Plausible and Impossible

- It is probable: Ferrari will continue on its current path of staying an exclusive car maker that sells cars without any conventional advertising/selling at very high prices to a global market.
- It is plausible: Ferrari will try to go for a higher growth model, introducing perhaps a lower-cost Ferrari, increasing advertising/selling expenses and settling for lower margins.
- It is impossible: Ferrari will go for sharply higher revenue growth, without cutting prices or increasing selling expenses.

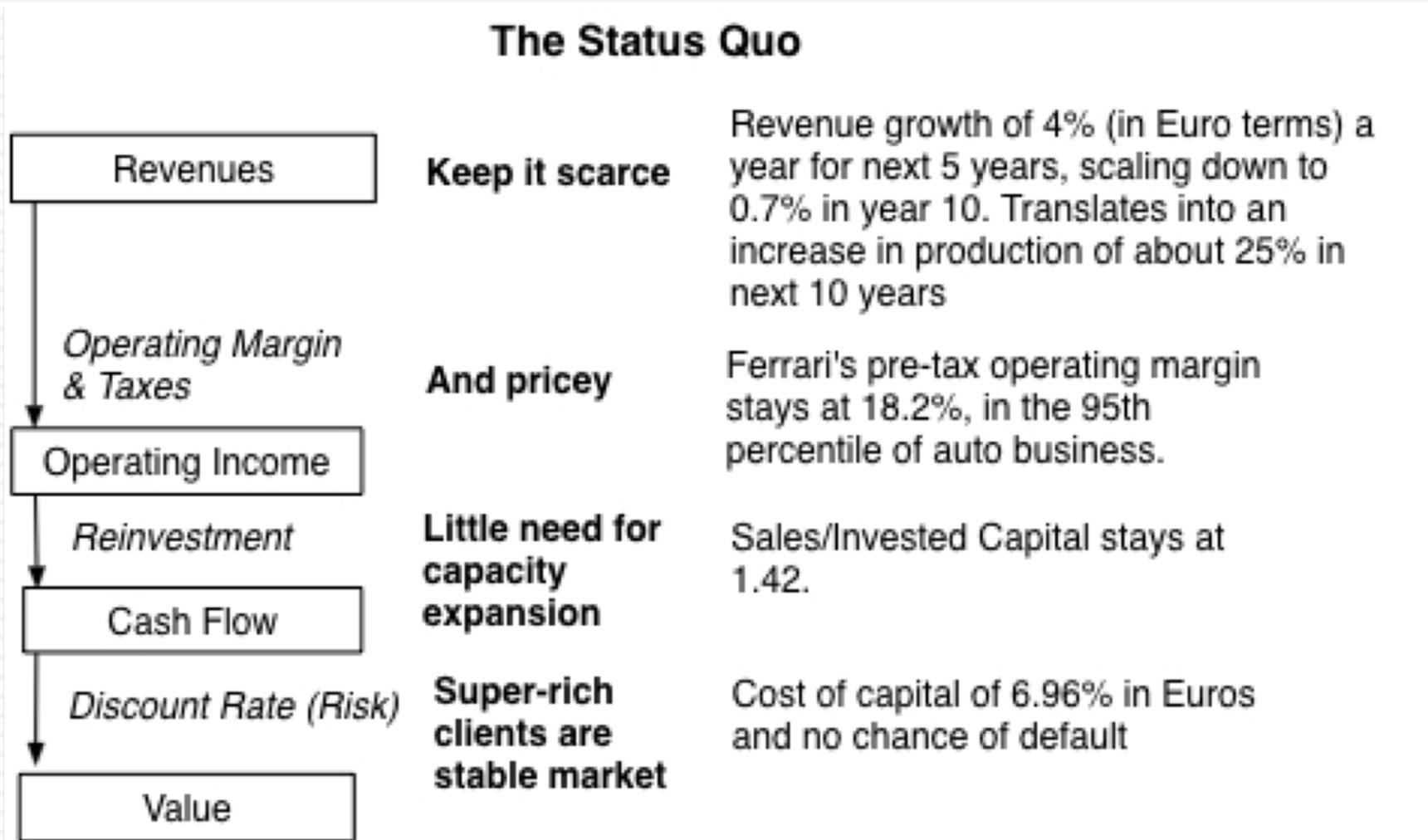
Step 4: Connect your narrative to key drivers of value



With Uber

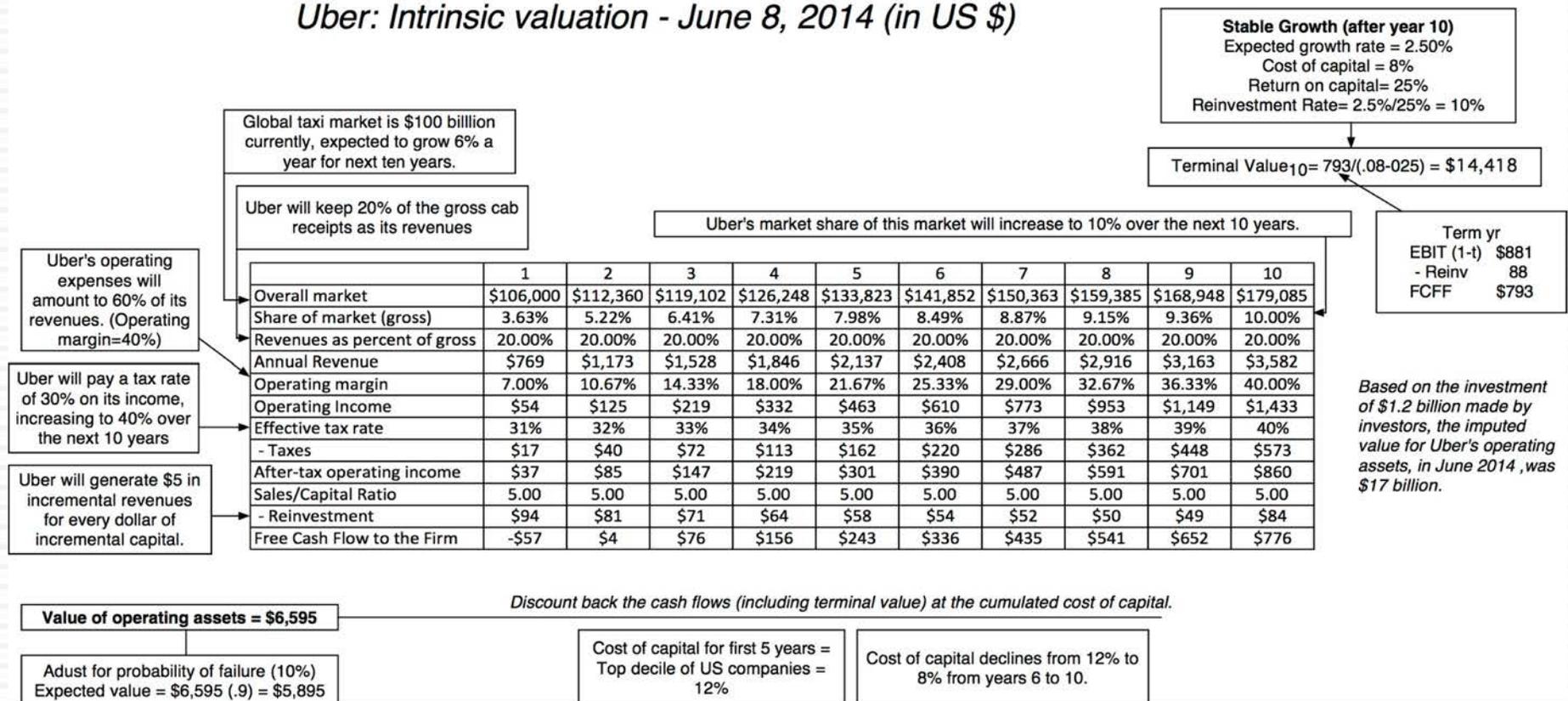


With Ferrari



Step 4: Value the company (Uber)

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



And Ferrari

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

47

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.

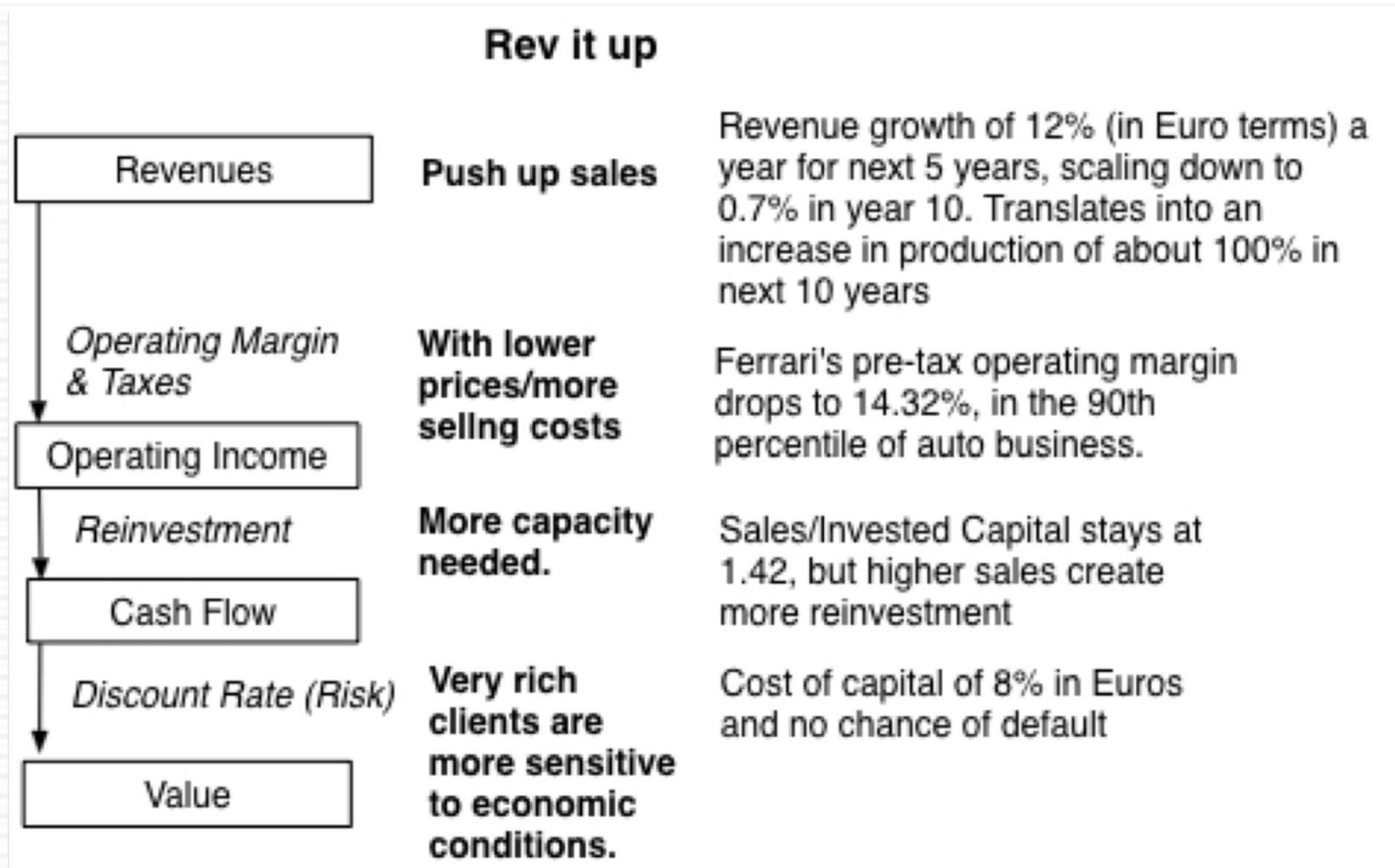
Valuing Bill Gurley's Uber narrative

	<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

Ferrari: A Rev it up Narrative



And valuation..

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

Step 6: Be ready to modify narrative as events unfold

52

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

The Bottom Line

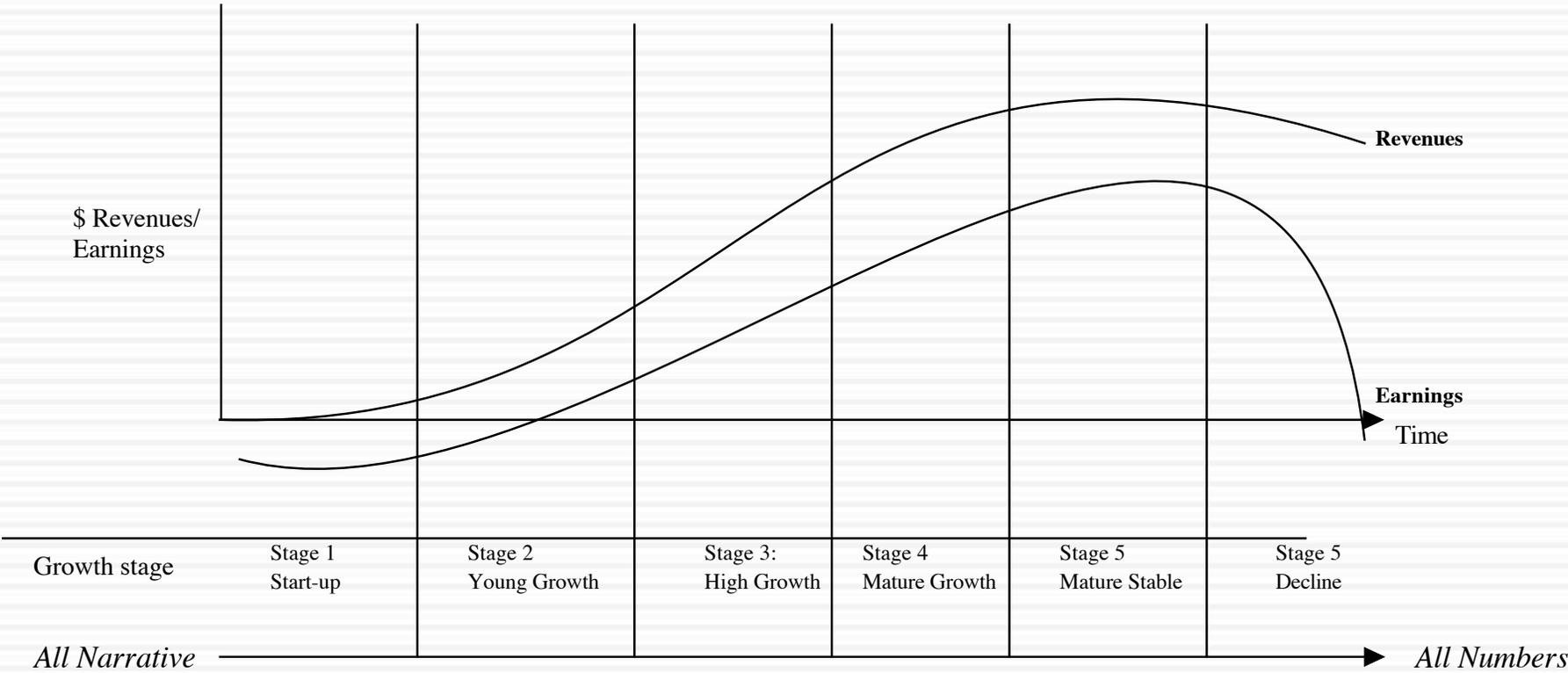
- To be a successful investor in early-stage businesses, you need to be a good judge of narrative. Not only do you need to be able to find good stories to invest in, but you also have to be able to separate impossible stories (fairy tales) from plausible stories, and then providing support (financial or management) to make the plausible into the probable.
- 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 Manager's job

Story Tellers, Business Builders and Managers

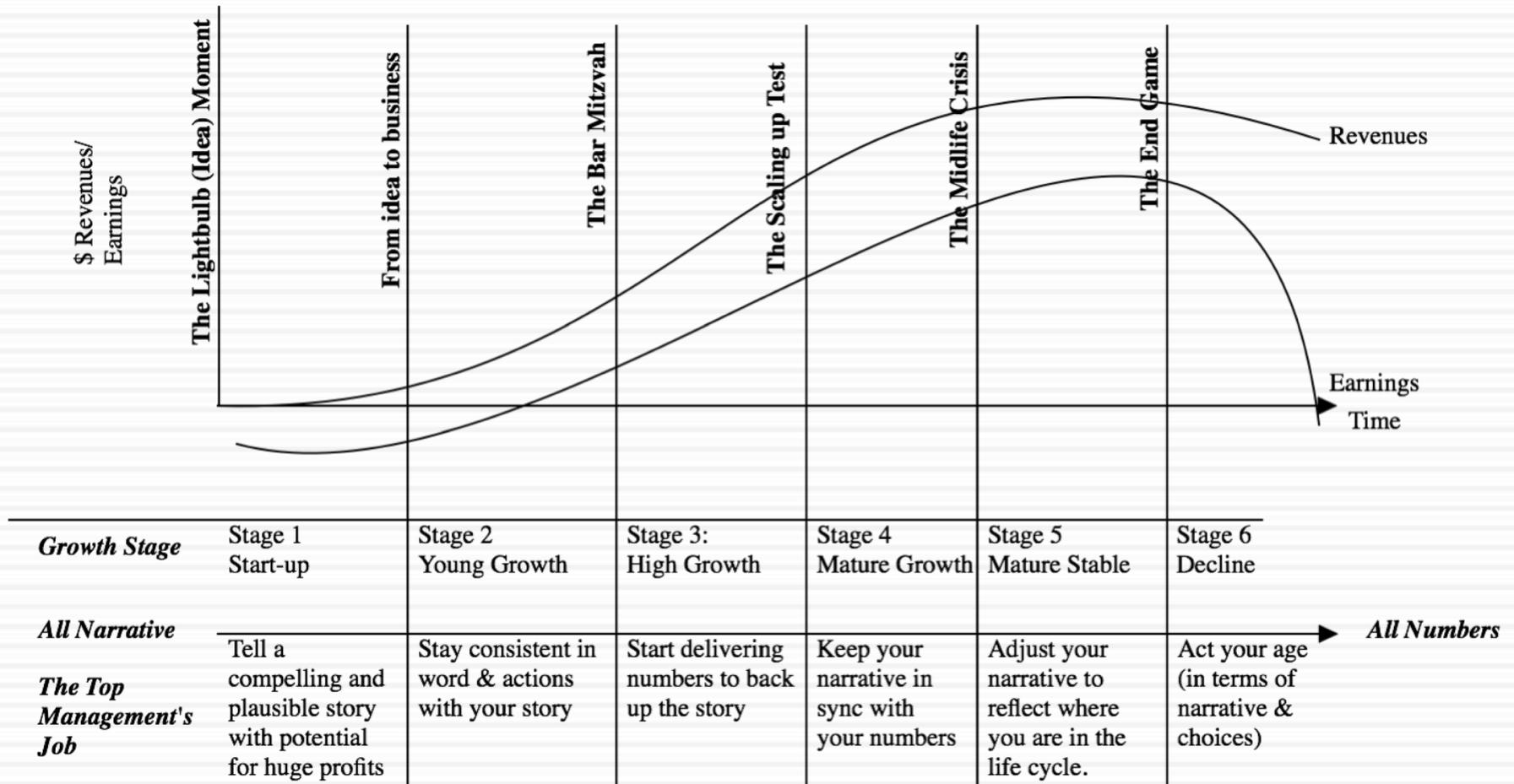
A Company's Life Cycle & Narrative/Numbers



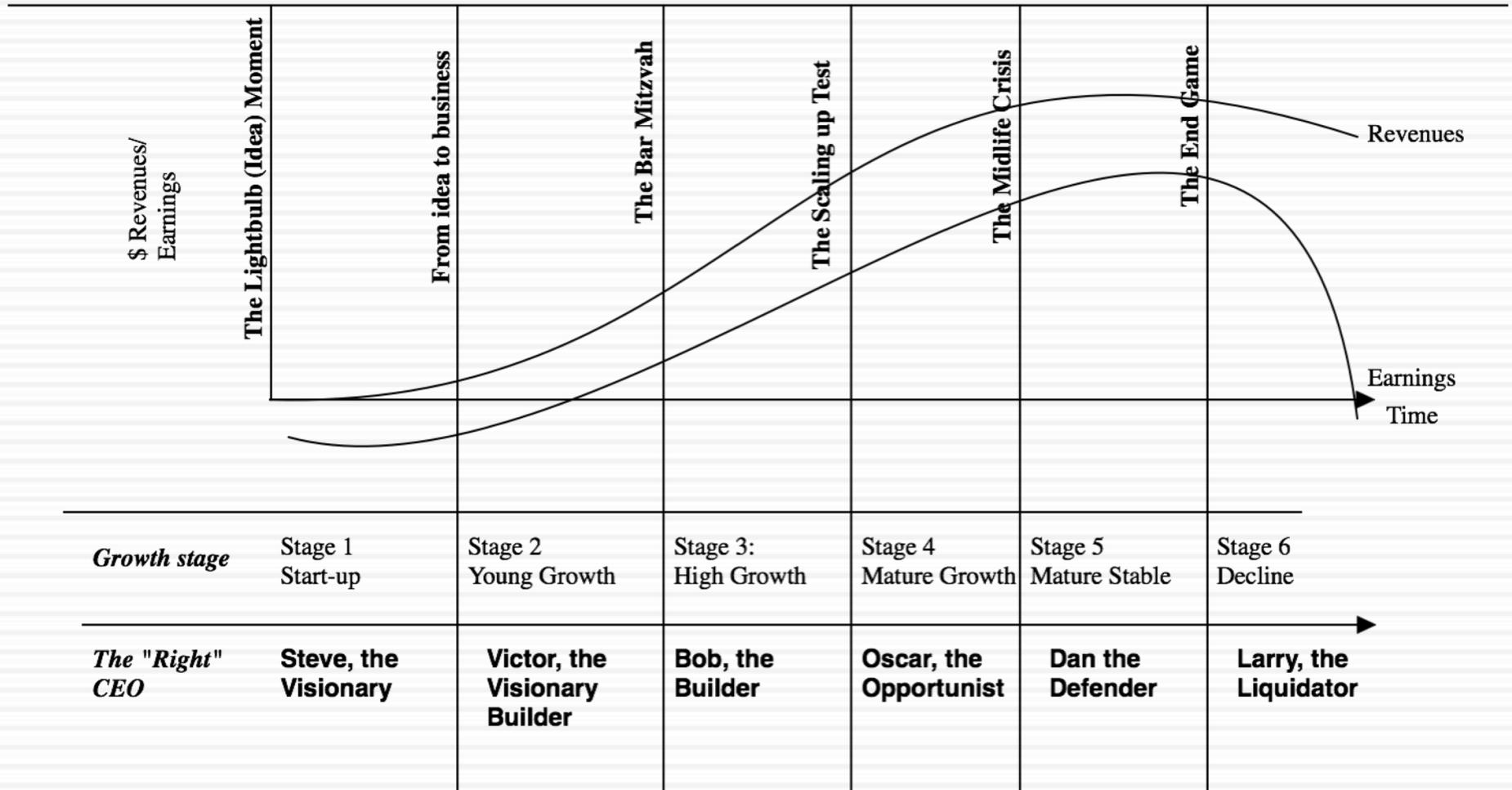
As companies age, the emphasis shifts..

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

And the focus changes..



The Right CEO for your company? It depends..



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

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



UNCERTAINTY: A FEATURE, NOT A BUG

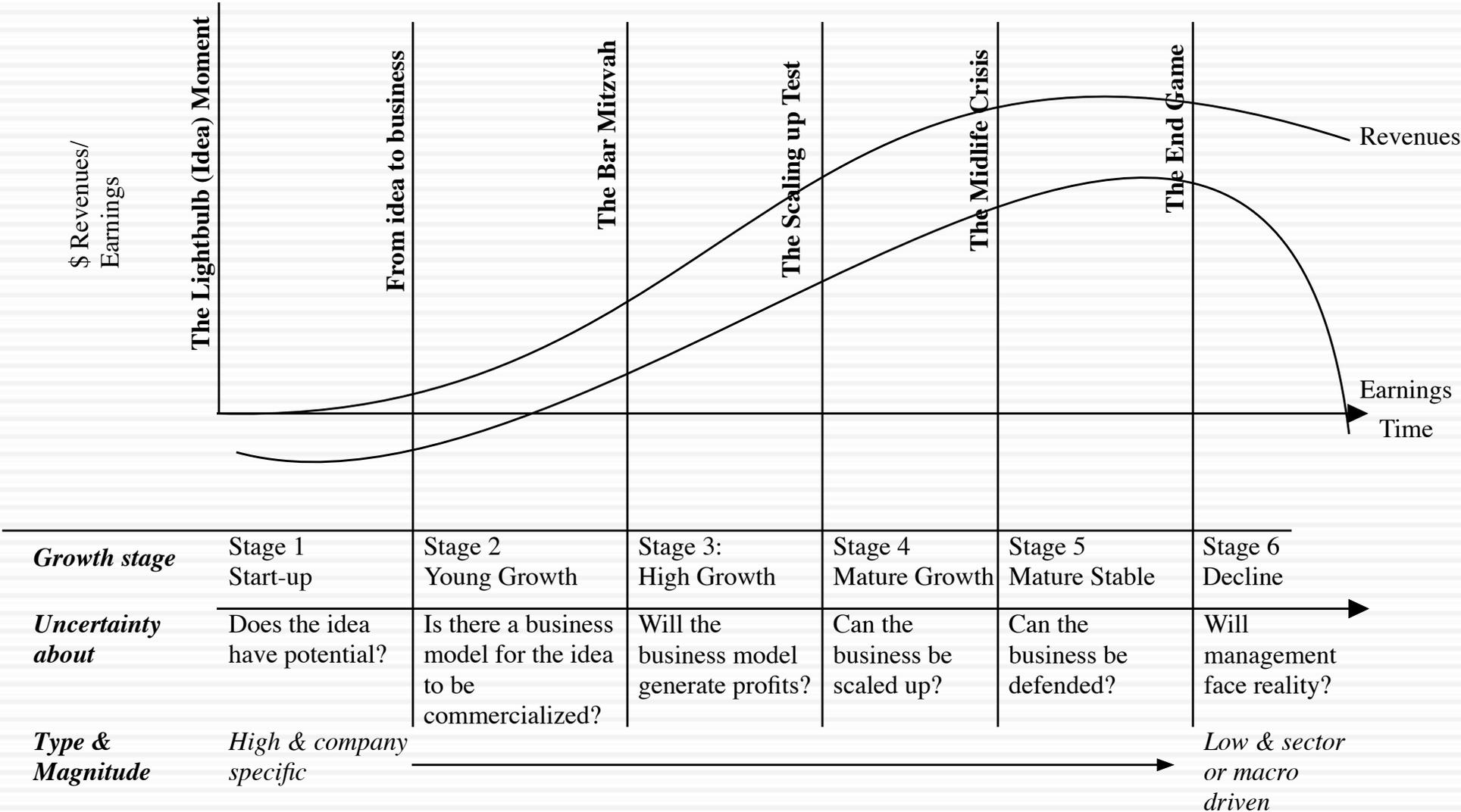
There are no facts, just opinions

Uncertainty in valuation

61

- Estimation versus Economic uncertainty
 - ▣ Estimation uncertainty reflects the possibility that you could have the “wrong model” or estimated inputs incorrectly within this model.
 - ▣ Economic uncertainty comes from the fact that markets and economies can change over time and that even the best models will fail to capture these unexpected changes.
- Micro uncertainty versus Macro uncertainty
 - ▣ Micro uncertainty refers to uncertainty about the potential market for a firm’s products, the competition it will face and the quality of its management team.
 - ▣ Macro uncertainty reflects the reality that your firm’s fortunes can be affected by changes in the macro economic environment.
- Discrete versus continuous uncertainty
 - ▣ Discrete risk: Risks that lie dormant for periods but show up at points in time. (Examples: A drug working its way through the FDA pipeline may fail at some stage of the approval process or a company in Venezuela may be nationalized)
 - ▣ Continuous risk: Risks changes in interest rates or economic growth occur continuously and affect value as they happen.

The Evolution of Uncertainty



3M: A Pre-crisis valuation

Current Cashflow to Firm
 EBIT(1-t)= 5344 (1-.35)= 3474
 - Nt CpX= 350
 - Chg WC 691
 = FCFF 2433
 Reinvestment Rate = 1041/3474
 =29.97%
 Return on capital = 25.19%

Reinvestment Rate
30%

Expected Growth in EBIT (1-t)
 $.30 \cdot .25 = .075$
7.5%

Return on Capital
25%

Stable Growth
 g = 3%; Beta = 1.10;
 Debt Ratio= 20%; Tax rate=35%
 Cost of capital = 6.76%
 ROC= 6.76%;
 Reinvestment Rate=3/6.76=44%

Terminal Value₅ = 2645 / (.0676 - .03) = 70,409

Op. Assets 60607
 + Cash: 3253
 - Debt 4920
 =Equity 58400
 Value/Share \$ 83.55

First 5 years

Year	1	2	3	4	5	Term Yr
EBIT (1-t)	\$3,734	\$4,014	\$4,279	\$4,485	\$4,619	\$4,758
- Reinvestment	\$1,120	\$1,204	\$1,312	\$1,435	\$1,540	\$2,113
= FCFF	\$2,614	\$2,810	\$2,967	\$3,049	\$3,079	\$2,645

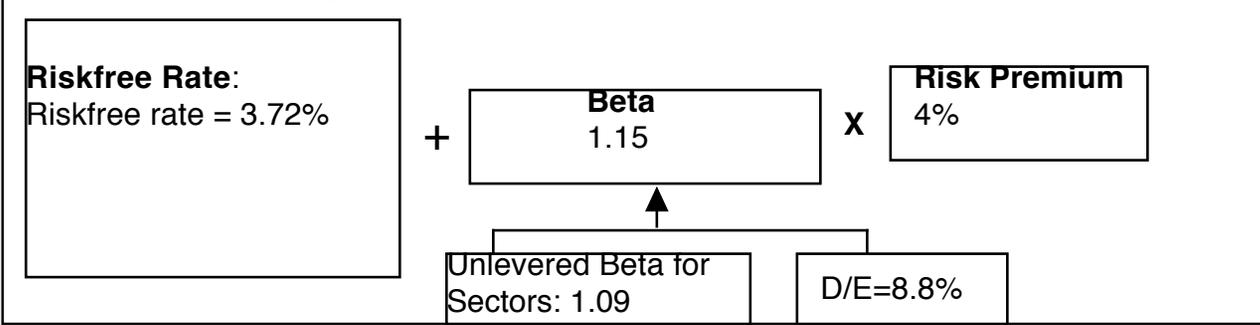
Cost of capital = 8.32% (0.92) + 2.91% (0.08) = 7.88%

Cost of Equity
8.32%

Cost of Debt
 $(3.72\% + .75\%)(1 - .35)$
 = 2.91%

Weights
 E = 92% D = 8%

On September 12, 2008, 3M was trading at \$70/share



Tata Motors: April 2010

Current Cashflow to Firm

EBIT(1-t) :	Rs 20,116
- Nt CpX	Rs 31,590
- Chg WC	Rs 2,732
= FCFF	- Rs 14,205

Reinv Rate = $(31590+2732)/20116 = 170.61\%$; Tax rate = 21.00%
Return on capital = 17.16%

Average reinvestment rate
from 2005-09: 179.59%;
without acquisitions: 70%

Reinvestment Rate
70%

**Expected Growth
from new inv.**
 $.70 * .1716 = 0.1201$

Return on Capital
17.16%

Stable Growth
 $g = 5\%$; Beta = 1.00
Country Premium = 3%
Cost of capital = 10.39%
Tax rate = 33.99%
ROC = 10.39%;
Reinvestment Rate = $g/ROC = 5/10.39 = 48.11\%$

Terminal Value₅ = $23493 / (.1039 - .05) = Rs 435,686$

Op. Assets Rs210,813
+ Cash: 11418
+ Other NO 140576
- Debt 109198
= Equity 253,628

Year	1	2	3	4	5	6	7	8	9	10
EBIT (1-t)	22533	25240	28272	31668	35472	39236	42848	46192	49150	51607
- Reinvestment	15773	17668	19790	22168	24830	25242	25138	24482	23264	21503
FCFF	6760	7572	8482	9500	10642	13994	17711	21710	25886	30104

45278
21785
23493

Value/Share Rs 614

Discount at Cost of Capital (WACC) = $14.00\% (.747) + 8.09\% (0.253) = 12.50\%$

*Growth declines to 5%
and cost of capital
moves to stable period
level.*

On April 1, 2010
Tata Motors price = Rs 781

Cost of Equity
14.00%

Cost of Debt
 $(5\% + 4.25\% + 3\%)(1 - .3399)$
= 8.09%

Weights
E = 74.7% D = 25.3%

Riskfree Rate:
Rs Riskfree Rate = 5%

+ **Beta** 1.20 X **Mature market premium** 4.5% + **Lambda** 0.80 X **Country Equity Risk Premium** 4.50%

Unlevered Beta for Sectors: 1.04

Firm's D/E Ratio: 33%

Country Default Spread 3%

X Rel Equity Mkt Vol 1.50

Infosys: March 2018 (in Rupees)

Cash flows from existing assets

	LTM	2011-2017	Industry (US data)
Revenue growth =	3.28%	14.22%	15.31%
Pre-tax operating margin =	24.29%	26.16%	8.35%
Sales to capital ratio =	1.81	2.50	3.69
Return on invested capital =	31.57%	47.80%	27.96%

The Payoff from growth

Revenues will grow 10% a year for next 5 years, tapering down to 5.38% growth in year 10

Operating margin (per-tax) will continue to decline from 24.29% to 23%

Sales/Invested Capital will stay at ten-year average of 1.81

Maturity and Closure

Stable Growth $g = 5.38\%$;
 Cost of capital = 9.88%
 ROC = 15%;
 Reinvestment Rate = $g/ROC = 5.83\%/15.00\% = 35.87\%$

Rupee Cashflows

Terminal Value = $169,632 / (.0988 - .0538) = 3,769,597$

PV(Terminal value)	₹ 1,366,411
PV (CF over next 10 years)	₹ 790,711
Value of operating assets =	₹ 2,157,122
- Debt	₹ -
- Minority interests	₹ -
+ Cash	₹ 230,727
+ Non-operating assets	₹ 61,081
Value of equity	₹ 2,448,930
- Value of options	₹ 945
Value of equity in common stock	₹ 2,447,985
Number of shares	₹ 2,283
Estimated value /share	₹ 1,072.22

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		10.00%	10.00%	10.00%	10.00%	10.00%	9.08%	8.15%	7.23%	6.30%	5.38%	5.38%
Revenues	₹ 683,119	₹ 751,431	₹ 826,574	₹ 909,231	₹ 1,000,155	₹ 1,100,170	₹ 1,200,021	₹ 1,297,847	₹ 1,391,656	₹ 1,479,386	₹ 1,558,976	₹ 1,642,849
EBIT (Operating) margin	24.29%	24.16%	24.03%	23.90%	23.78%	23.65%	23.52%	23.39%	23.26%	23.13%	23.00%	23.00%
EBIT (Operating income)	₹ 165,945	₹ 181,568	₹ 198,657	₹ 217,348	₹ 237,790	₹ 260,148	₹ 282,208	₹ 303,536	₹ 323,678	₹ 342,170	₹ 358,565	₹ 377,855
Tax rate	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.40%	28.80%	29.20%	29.60%	30.00%	30.00%
EBIT(1-t)	₹ 119,480	₹ 130,729	₹ 143,033	₹ 156,491	₹ 171,209	₹ 187,306	₹ 202,061	₹ 216,118	₹ 229,164	₹ 240,888	₹ 250,995	₹ 264,499
- Reinvestment	₹ 37,842	₹ 41,626	₹ 45,789	₹ 50,368	₹ 55,404	₹ 55,313	₹ 54,191	₹ 51,966	₹ 48,599	₹ 44,090	₹ 44,090	₹ 94,867
FCFF	₹ 92,887	₹ 101,407	₹ 110,702	₹ 120,841	₹ 131,902	₹ 146,747	₹ 161,927	₹ 177,198	₹ 192,289	₹ 206,905	₹ 206,905	₹ 169,632
Cost of capital	11.02%	11.02%	11.02%	11.02%	11.02%	11.02%	10.80%	10.57%	10.34%	10.11%	9.88%	
Cumulated discount factor	0.9007	0.8113	0.7307	0.6581	0.5928	0.5350	0.4839	0.4386	0.3983	0.3625		
PV(FCFF)	₹ 83,664	₹ 82,268	₹ 80,890	₹ 79,531	₹ 78,190	₹ 78,514	₹ 78,356	₹ 77,712	₹ 76,588	₹ 74,999		

Discount at Rs Cost of Capital (WACC) = 11.02% (.100) = 11.02%

The Risk in the Cash flows

On March 27, 2018, Infosys was trading at Rs 1150/ share

Cost of Equity 11.02%

Cost of Debt NO DEBT

Weights E = 100% D = 0%

Riskfree Rate:
 Rupee Risk free Rate = 7.33% - 1.95% = 5.38%

Beta = 1.03

Firm's D/E Ratio: 0%

Business	Revenues	EV/Sales	Estimated Value	Value Weight	Unlevered Beta
Computer Software	₹ 2,101	6.3640	₹ 13,371	13.51%	1.1114
Computer Services	₹ 66,383	1.2899	₹ 85,630	86.49%	1.0136
Company	₹ 68,484		₹ 99,001		1.0268

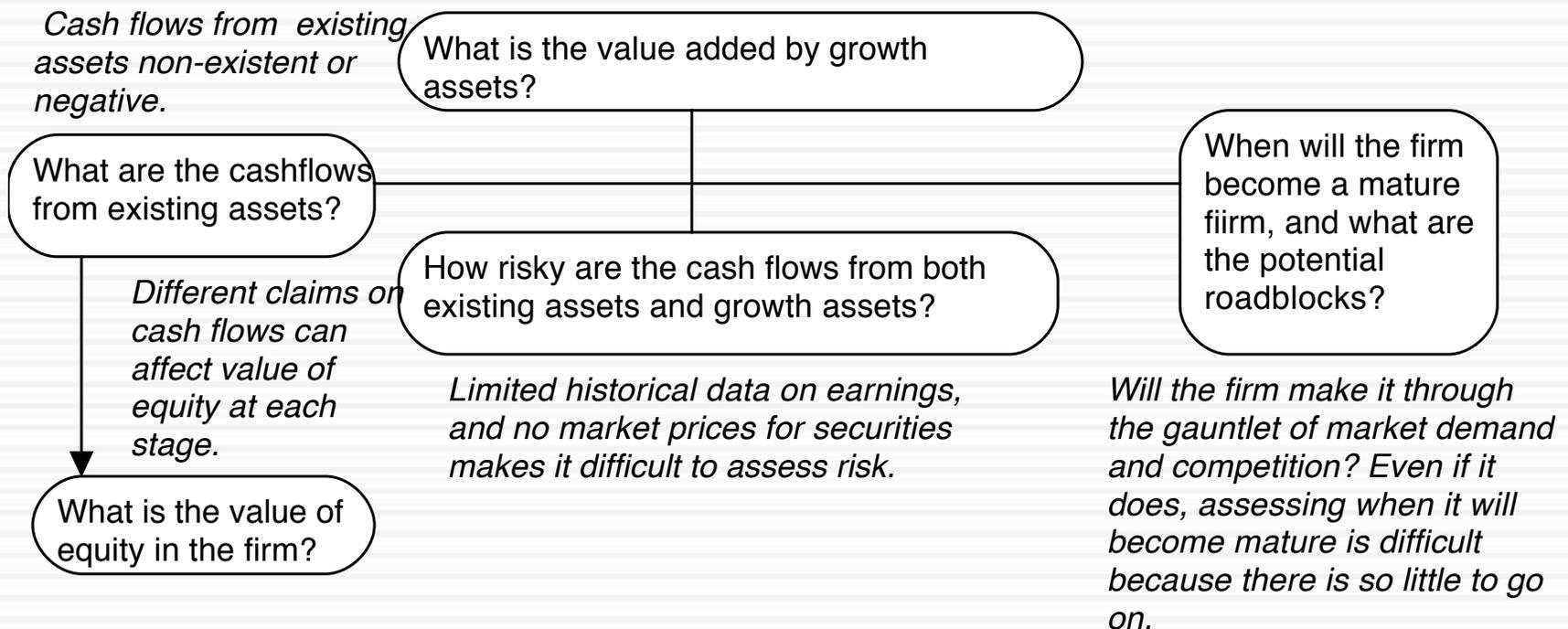
ERP = 5.50%

Region	Revenues	ERP	Weight	Weighted ERP
North America	₹ 42,408	5.08%	62.01%	3.1499%
Europe	₹ 15,302	6.01%	22.37%	1.3437%
Rest of the World	₹ 8,504	6.21%	12.43%	0.7721%
India	₹ 2,180	7.27%	3.19%	0.2317%
Total	₹ 68,394		100.00%	5.4974%

So, what's different about a young start up?

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

Making judgments on revenues/ profits difficult because you cannot draw on history. If you have no product/service, it is difficult to gauge market potential or profitability. The company's entire value lies in future growth but you have little to base your estimate on.



The Dark Side will beckon.. Don't be tempted..

67

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

Twitter: Setting the table in October 2013

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

Twitter: Priming the Pump for Valuation

1. Make small revenues into big revenues

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

2. Make losses into profits

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

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

My estimate for 2023: Overall online advertising market will be close to \$200 billion and Twitter will have about 5.7% (\$11.5 billion)

Aswath Damodaran

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

3. Reinvest for growth

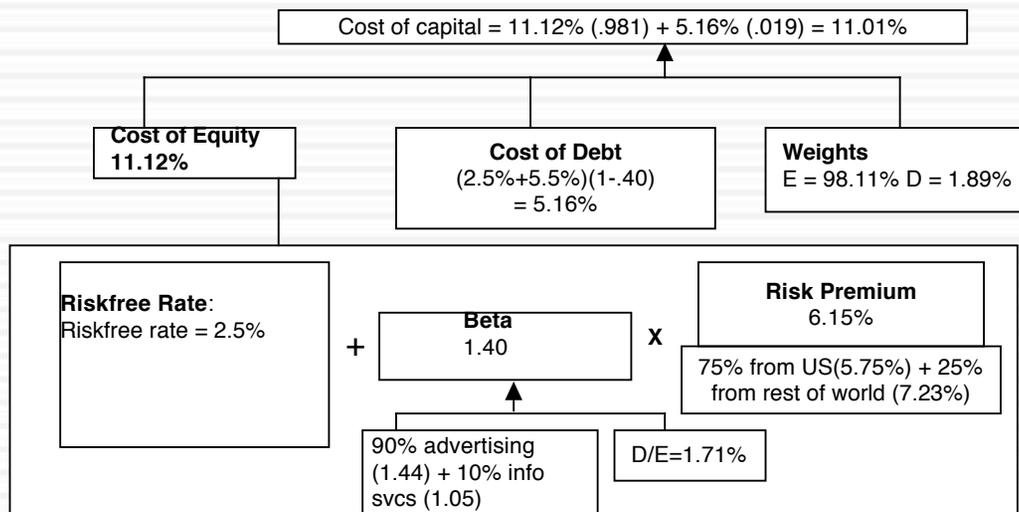
	Sales/ Invested Capital
Twitter (2013)	1.10
Advertising Companies	1.40
Social Media Companies	1.05

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

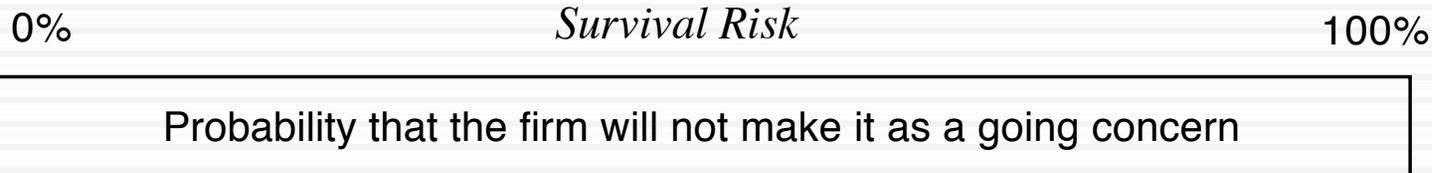
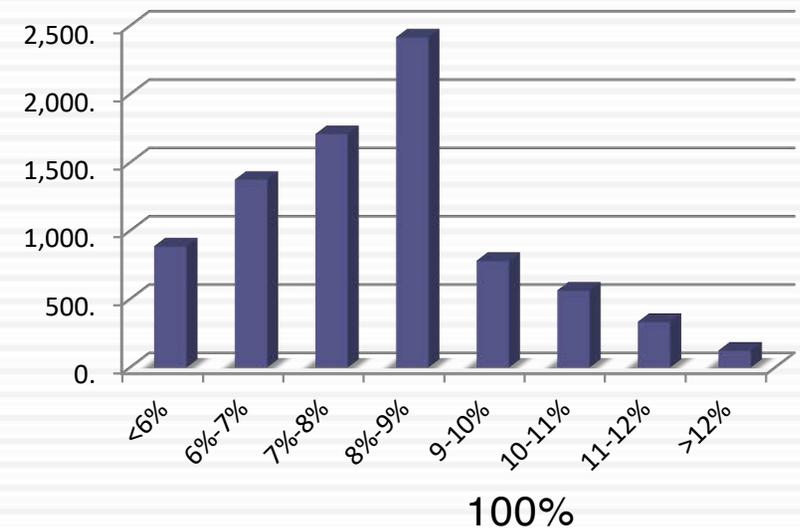
Sweating the small stuff: Risk and Required Return

Risk in the discount rate

My estimate for Twitter



Cost of Capital: US - Nov '13



Certain to make it as going concern

Certain to fail

My assumption for Twitter

Starting numbers

Twitter Pre-IPO Valuation: October 27, 2013

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

Revenue growth of 51.5% a year for 5 years, tapering down to 2.5% in year 10

Pre-tax operating margin increases to 25% over the next 10 years

Sales to capital ratio of **1.50** for incremental sales

Stable Growth
 $g = 2.5\%$; $\text{Beta} = 1.00$;
 Cost of capital = 8%
 $\text{ROC} = 12\%$;
 Reinvestment Rate = $2.5\%/12\% = 20.83\%$

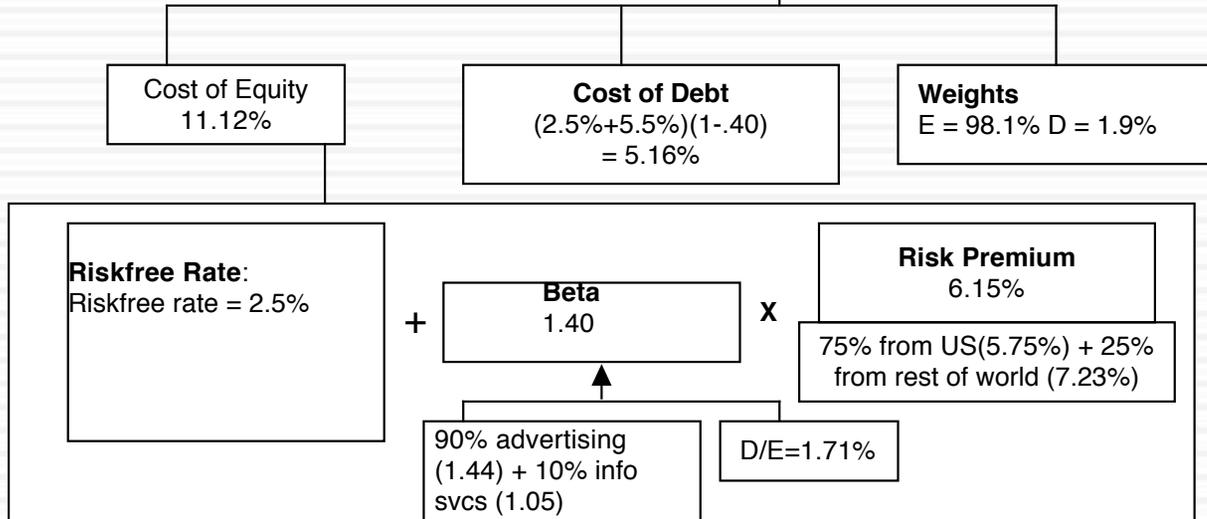
Terminal Value₁₀ = $1466 / (.08 - .025) = \$26,657$

		1	2	3	4	5	6	7	8	9	10
Operating assets	\$9,705										
+ Cash	321										
+ IPO Proceeds	1295										
- Debt	214										
Value of equity	11,106										
- Options	713										
Value in stock	10,394										
/ # of shares	582.46										
Value/share	\$17.84										
Revenues		\$ 810	\$1,227	\$1,858	\$2,816	\$4,266	\$6,044	\$7,973	\$9,734	\$10,932	\$11,205
Operating Income		\$ 31	\$ 75	\$ 158	\$ 306	\$ 564	\$ 941	\$1,430	\$1,975	\$ 2,475	\$ 2,801
Operating Income after tax		\$ 31	\$ 75	\$ 158	\$ 294	\$ 395	\$ 649	\$ 969	\$1,317	\$ 1,624	\$ 1,807
- Reinvestment		\$ 183	\$ 278	\$ 421	\$ 638	\$ 967	\$1,186	\$1,285	\$1,175	\$ 798	\$ 182
FCFF		\$(153)	\$(203)	\$(263)	\$(344)	\$(572)	\$(537)	\$(316)	\$ 143	\$ 826	\$ 1,625

Terminal year (11)
 EBIT (1-t) \$ 1,852
 - Reinvestment \$ 386
 FCFF \$ 1,466

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

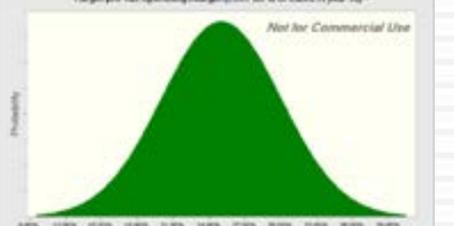
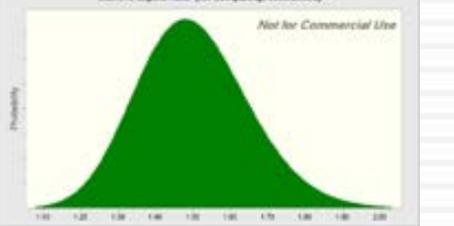
Cost of capital decreases to 8% from years 6-10



The Bottom Line

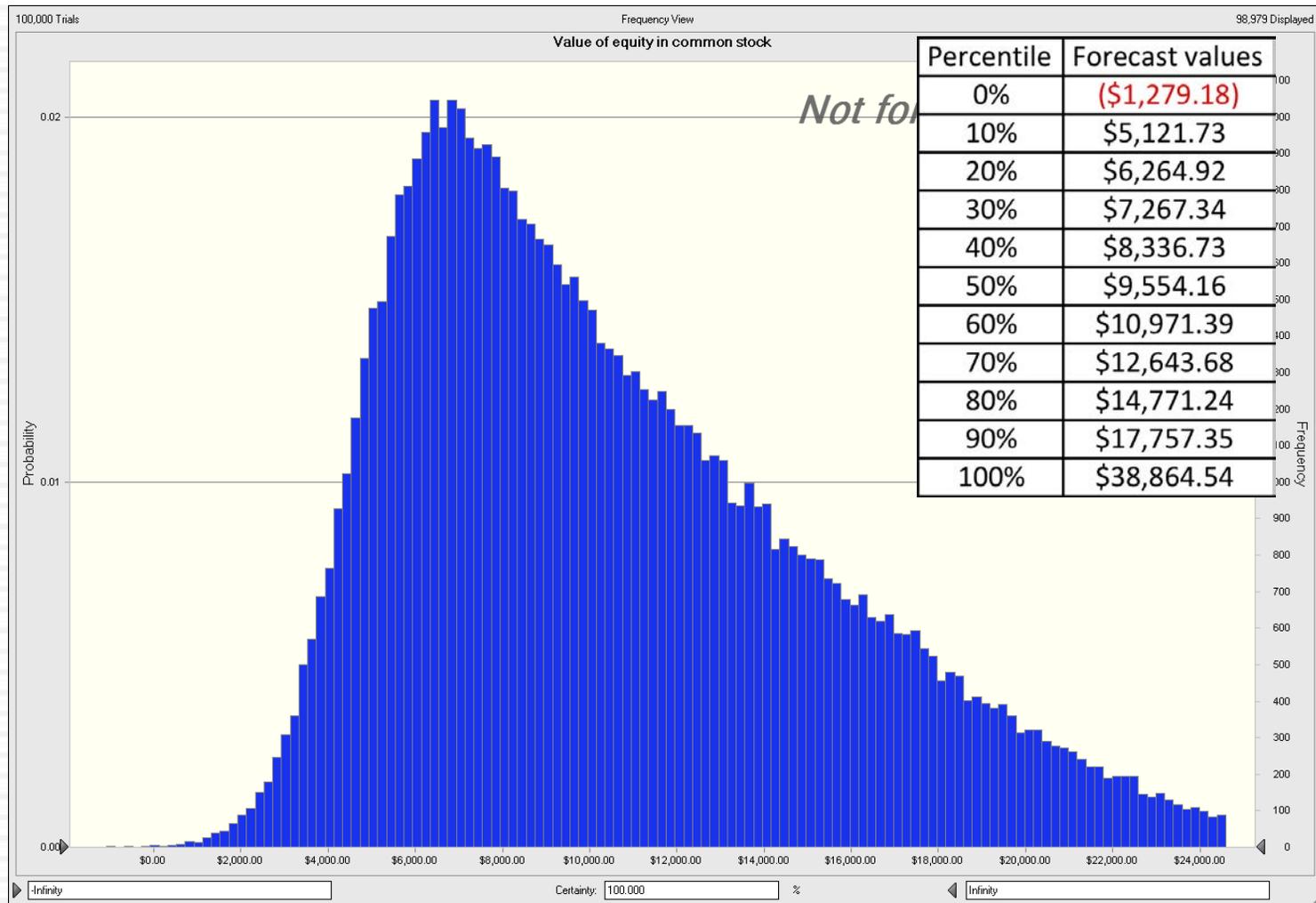
- Early in a company's life, it is a fact of life that everything is uncertain. Consulting with experts, collecting more data or building bigger models will not make the uncertainty go away.
- As you move from mature companies to young companies, you have to be willing to move from
 - ▣ Rule-based valuation to principle-based valuation
 - ▣ Being reliant on historical data to market-based best judgments
 - ▣ Wanting the right answer to being okay with being wrong (sometimes horribly so).
 - ▣ Point estimate valuations to valuation distributions

To illustrate: Revisiting the Twitter valuation...

<p>Revenue Growth Rate Distribution: Uniform Expected Value = 55% Minimum Value: 40% Maximum Value: 70%</p>	<p>Compounded annual revenue growth rate over next 5 years =</p> <p><i>Not for Commercial Use</i></p> 
<p>Target Operating Margin Distribution: Normal Expected Value = 25% Standard Deviation = 5%</p>	<p>Target pre-tax operating margin (EBIT as % of sales in year 10) =</p> <p><i>Not for Commercial Use</i></p> 
<p>Sales to Capital Ratio Distribution: Lognormal Expected value: 1.50 Standard deviation: 0.15</p>	<p>Sales to capital ratio (for computing reinvestment) =</p> <p><i>Not for Commercial Use</i></p> 
<p>Cost of Capital Distribution: Triangular Expected value: 11.22% Minimum value: 10.02% Maximum value: 12.22%</p>	<p>Initial cost of capital =</p> <p><i>Not for Commercial Use</i></p> 

With the consequences for equity value...

74



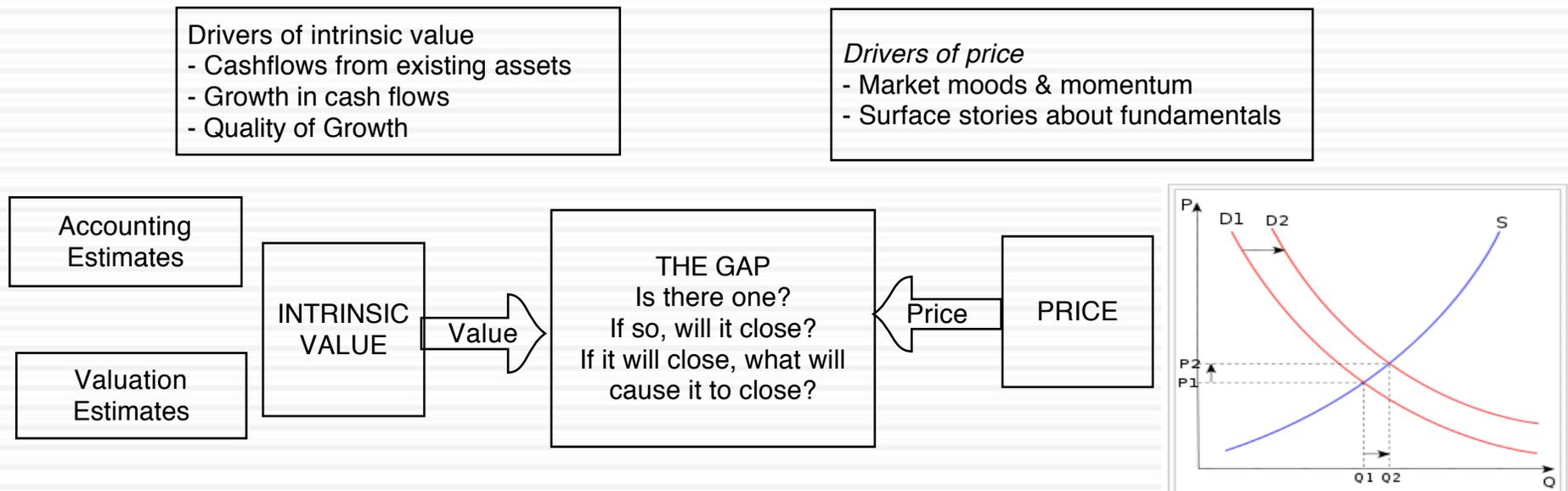


PRICE VERSUS VALUE



Price versus Value: The Set up

76



The determinants of price

77

Mood and Momentum

Price is determined in large part by mood and momentum, which, in turn, are driven by behavioral factors (panic, fear, greed).

Liquidity & Trading Ease

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

The Market Price

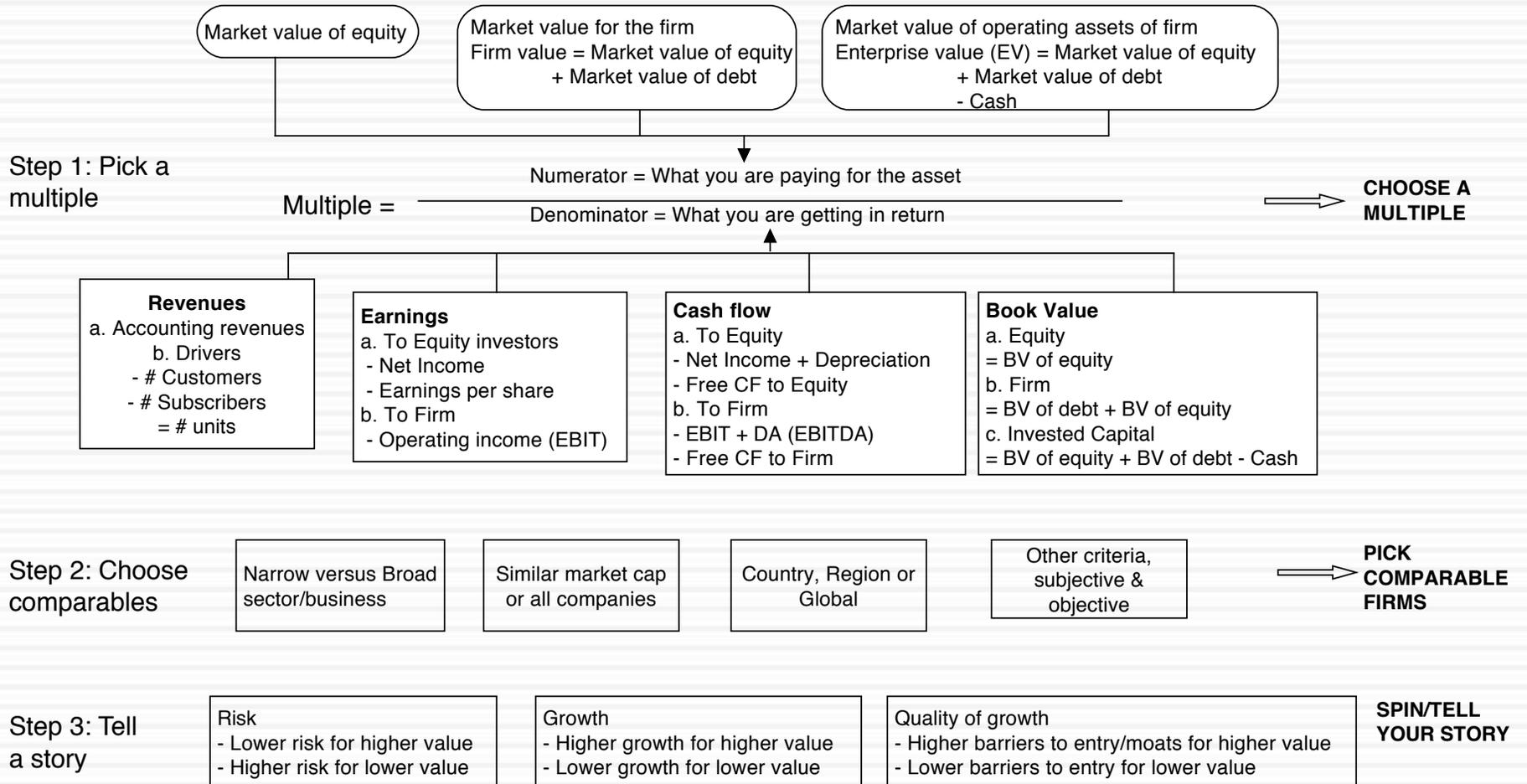
Incremental information

Since you make money on price changes, not price levels, the focus is on incremental information (news stories, rumors, gossip) and how it measures up, relative to expectations

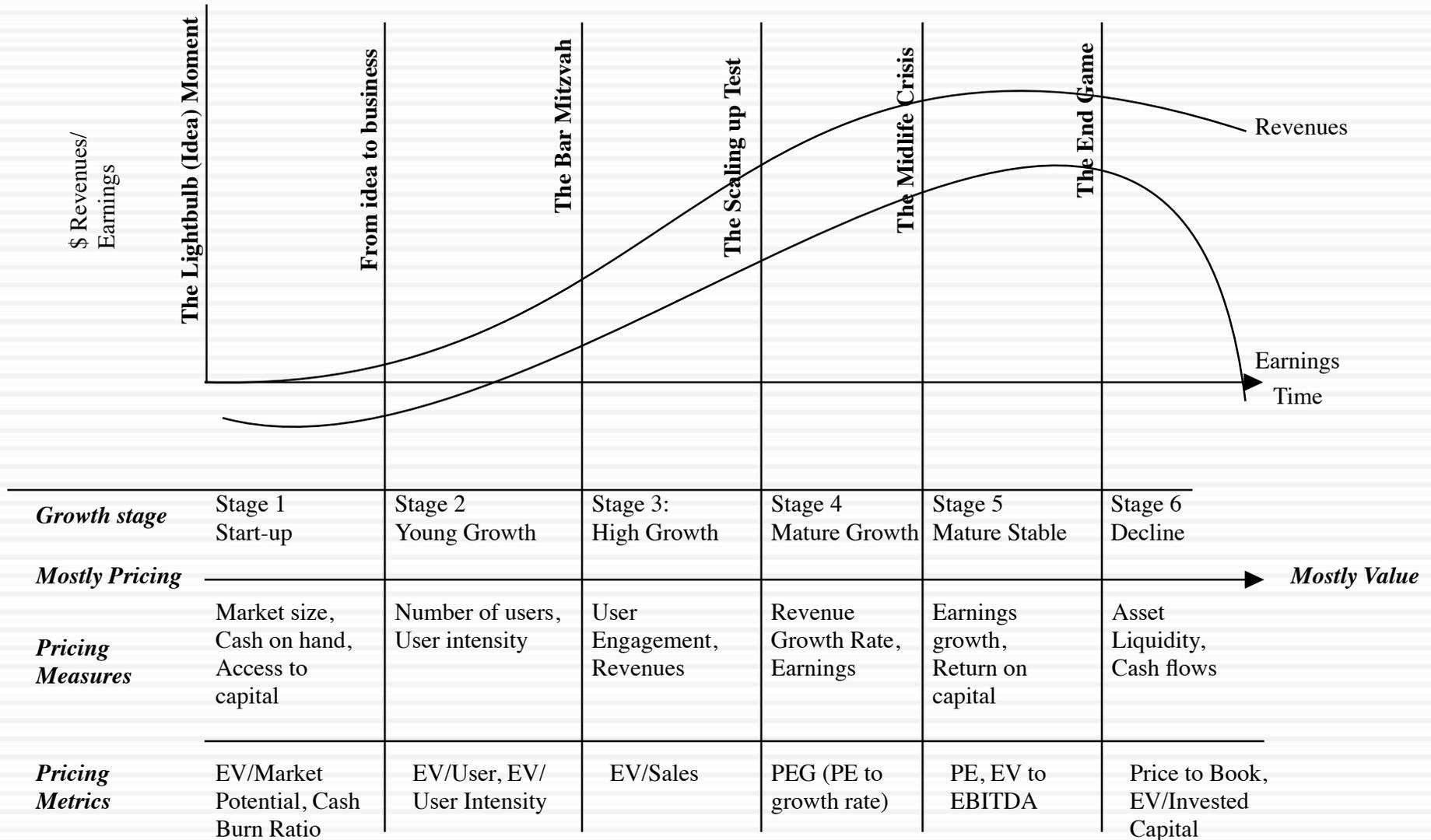
Group Think

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

Multiples and Comparable Transactions



The Pricing Game



Pricing Twitter: Start with the “comparables”

80

Company	Market Cap	Enterprise value	Revenues	EBITDA	Net Income	Number of users (millions)	EV/User	EV/Revenue	EV/EBITDA	PE
Facebook	\$173,540.00	\$160,090.00	\$7,870.00	\$3,930.00	\$1,490.00	1230.00	\$130.15	20.34	40.74	116.47
Linkedin	\$23,530.00	\$19,980.00	\$1,530.00	\$182.00	\$27.00	277.00	\$72.13	13.06	109.78	871.48
Pandora	\$7,320.00	\$7,150.00	\$655.00	-\$18.00	-\$29.00	73.40	\$97.41	10.92	NA	NA
Groupon	\$6,690.00	\$5,880.00	\$2,440.00	\$125.00	-\$95.00	43.00	\$136.74	2.41	47.04	NA
Netflix	\$25,900.00	\$25,380.00	\$4,370.00	\$277.00	\$112.00	44.00	\$576.82	5.81	91.62	231.25
Yelp	\$6,200.00	\$5,790.00	\$233.00	\$2.40	-\$10.00	120.00	\$48.25	24.85	2412.50	NA
Open Table	\$1,720.00	\$1,500.00	\$190.00	\$63.00	\$33.00	14.00	\$107.14	7.89	23.81	52.12
Zynga	\$4,200.00	\$2,930.00	\$873.00	\$74.00	-\$37.00	27.00	\$108.52	3.36	39.59	NA
Zillow	\$3,070.00	\$2,860.00	\$197.00	-\$13.00	-\$12.45	34.50	\$82.90	14.52	NA	NA
Trulia	\$1,140.00	\$1,120.00	\$144.00	-\$6.00	-\$18.00	54.40	\$20.59	7.78	NA	NA
Tripadvisor	\$13,510.00	\$12,860.00	\$945.00	\$311.00	\$205.00	260.00	\$49.46	13.61	41.35	65.90
						Average	\$130.01	11.32	350.80	267.44
						Median	\$97.41	10.92	44.20	116.47

Read the tea leaves: See what the market cares about

81

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

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

Use the “market metric” and “market price”

82

- The most important variable, in late 2013, in determining market value and price in this sector (social media, ill defined as that is) is the number of users that a company has.
- Looking at comparable firms, it looks like the market is paying about \$100/user in valuing social media companies, with a premium for “predictable” revenues (subscriptions) and user intensity.
- Twitter has about 240 million users and can be valued based on the \$100/user:
- Enterprise value = $240 * 100 = \$24$ billion

Pricing Ferrari

Market Pricing of Auto Companies

<i>Size Class</i>	<i># Firms</i>	<i>Operating Margin</i>	<i>Net Margin</i>	<i>Pre-tax ROIC</i>	<i>ROE</i>	<i>EV/Sales</i>	<i>EV/Inv Cap</i>	<i>EV/EBITDA</i>	<i>PE</i>	<i>PBV</i>
Largest (>\$10 billion)	31	6.31%	5.23%	6.63%	12.24%	0.95	1.00	9.06	9.72	1.26
2	16	5.24%	5.57%	10.72%	13.33%	0.71	1.46	7.56	13.03	1.73
3	14	2.43%	3.19%	3.40%	5.39%	0.95	1.33	13.23	18.54	1.49
4	20	1.51%	-0.40%	2.02%	-0.87%	0.87	1.16	13.73	17.57	1.32
Smallest	26	2.46%	2.56%	2.74%	9.30%	0.97	1.09	8.85	2.19	1.40

	<i>Ferrari (my estimated value)</i>	<i>Auto Sector</i>	<i>Reason for difference</i>
EV/Sales	2.10	0.94	Ferrari's operating margin is 18.2% versus Industry average of 6.58%.
EV/Invested Capital	1.97	1.02	Ferrari earns a much higher return on capital (14.56%) than the sector (6.68%)
EV/EBITDA	12.57	9.05	Ferrari EBITDA/Invested capital is 15.68% versus Industry average of 14.45%.
PE	22.87	10.00	Ferrari has a debt ratio of 9.43% versus Industry average of 39.06%.
PBV	2.56	1.29	Ferrari has a slightly higher ROE and lower equity risk (because of less debt)

Infosys: Priced against other Indian tech firms

	Trailing PE	PEG	PBV	EV/Sales	Expected Growth	ROE	Operating Margin
Infosys	15.42	1.99	3.97	3.40	8.90%	25.49%	24.29%
TCS	21.02	1.90	6.72	4.60	10.90%	33.23%	25.02%
HCL	15.22	1.34	3.82	2.99	12.30%	30.14%	20.11%
Wipro	14.72	1.83	2.63	2.47	9.12%	17.81%	16.23%
IT India (99 companies)							
25th Percentile	13.75	0.57	1.00	0.72	11.10%	0.88%	1.61%
Median	18.92	1.33	1.83	1.52	13.80%	11.45%	7.69%
75th Percentile	26.94	1.99	3.44	2.68	36.00%	21.13%	14.56%

Controlling for Differences?

- There are clear differences in fundamentals across IT companies, especially when it comes to margins and ROE, which may explain variation in pricing multiples.
- Regressing EV/Sales against pre-tax operating margin, for instance:

$$\text{EV/ Sales} = 0.924 + 12.93 \text{ Operating Margin} \quad R^2 = 44.5\%$$

(2.82) (8.74)

- Plugging in Infosys operating margin (24.29%) into the regression, we get:

$$\text{EV/ Sales} = 0.924 + 12.93 (.2429) = 3.04$$

At 3.40 times sales, Infosys looks over priced by about 10% against other Indian IT companies.

The Bottom Line

- As companies age, it is natural for the metric on which they are priced to change from revenue proxies to revenues to earnings to book value.
- Using a metric that is designed for one stage in the life cycle to price companies in a different stage will yield results that can range from puzzling (if you don't act on them) to catastrophic.
 - Old time value investors who use PE ratios will always find young companies to be over priced, no matter what their pricing is.
 - Growth investors who use revenue multiples will find mature companies look like bargains at all times.



“Growing old is mandatory, Growing up is optional”

Amvath Javdeen