VALUE ME, YOU MUST! A JEDI GUIDE TO VALUATION!

January 2021

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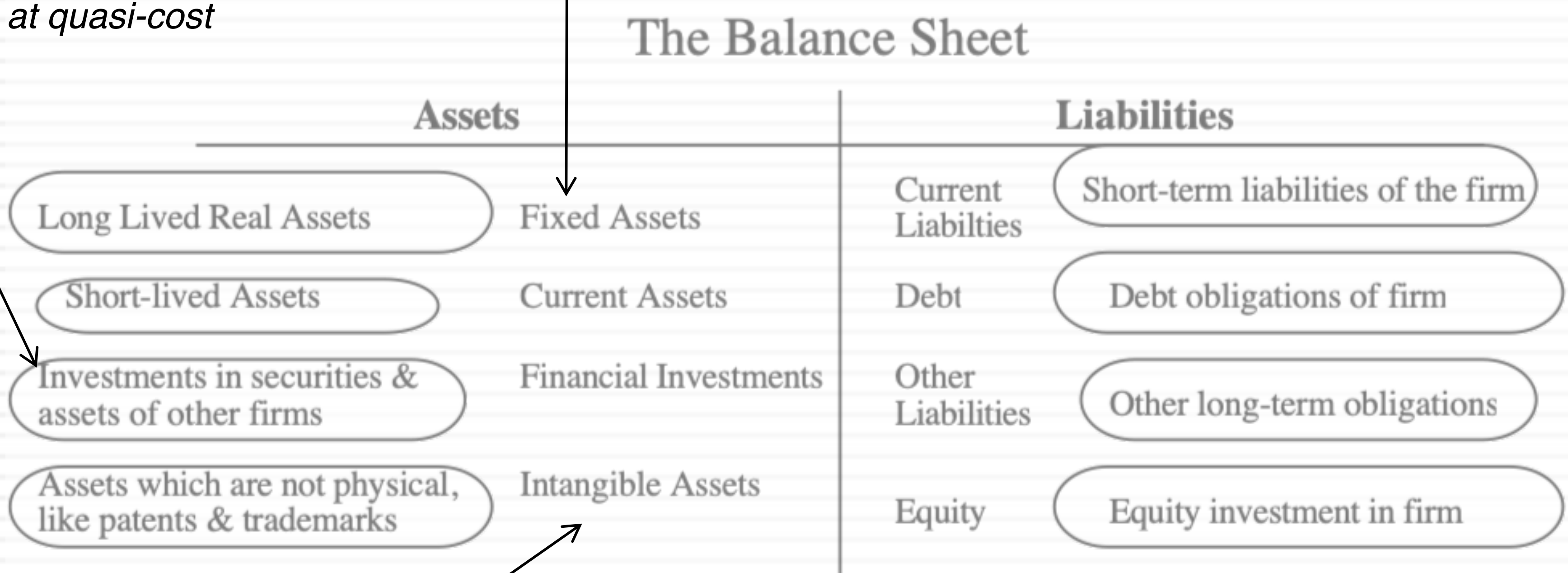
I. Don't mistake accounting for finance

Valued based upon motive for investment – some marked to market, some recorded at cost and some at quasi-cost

Assets are recorded at original cost, adjusted for depreciation.



True intangible assets like brand name, patents and customer did not show up. The only intangible asset of any magnitude (goodwill) is a plug variable that is of consequence only if you do an acquisition.

Equity reflects original capital invested and historical retained earnings.

The financial balance sheet

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

Assets		Liabilities	
Existing Investments Generate cashflows today Includes long lived (fixed) and short-lived(working capital) assets	Assets in Place	Debt	Fixed Claim on cash flows Little or No role in management *Fixed Maturity* *Tax Deductible*
Expected Value that will be created by future investments	Growth Assets	Equity	Residual Claim on cash flows Significant Role in management *Perpetual Lives*

Value will depend upon magnitude of growth investments and excess returns on these investments

Intrinsic value of equity, reflecting intrinsic value of assets, net of true value of debt outstanding.

II. Don't assume that D+CF = DCF

- 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:

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

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…

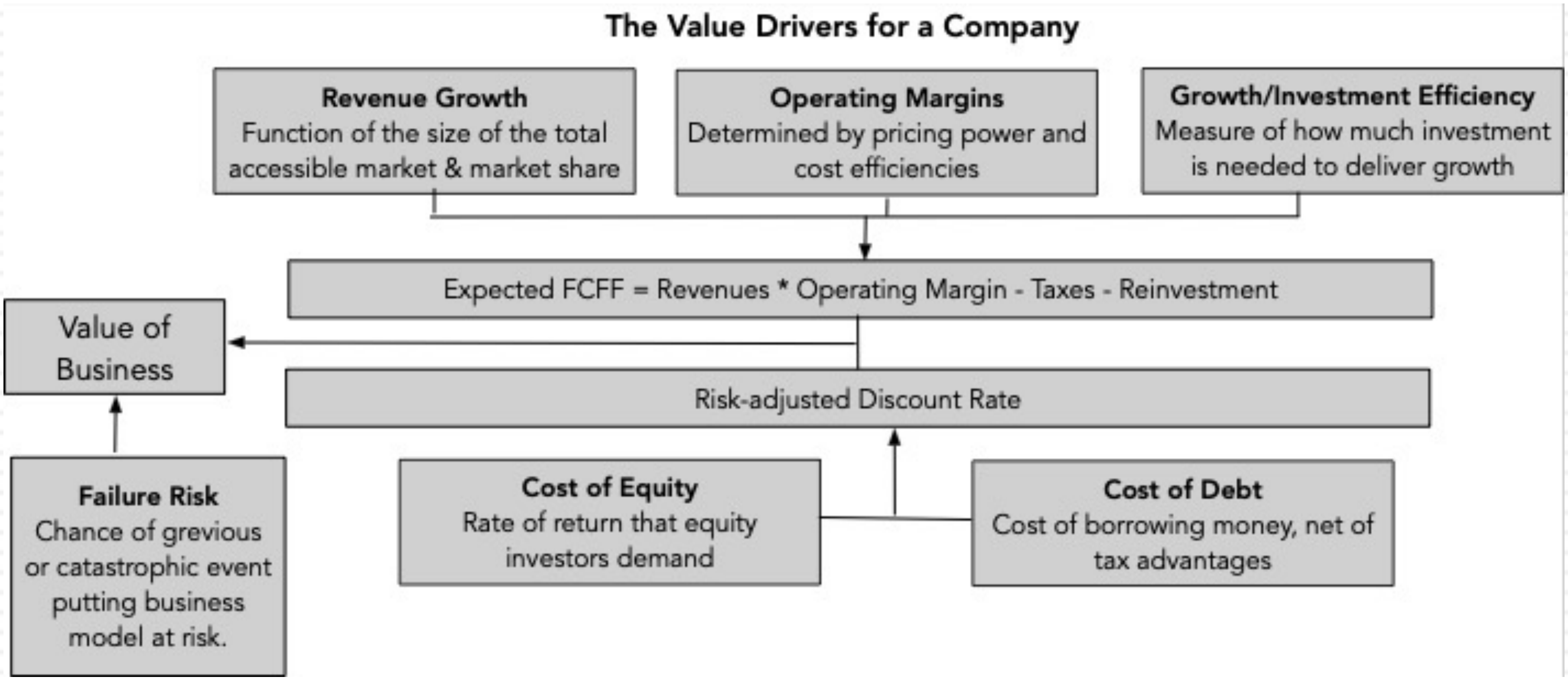
What are the **cashflows from existing assets**?
- Equity: Cashflows after debt payments
- Firm: Cashflows before debt payments

What is the **value added** by growth assets?
Equity: Growth in equity earnings/ cashflows
Firm: Growth in operating earnings/ cashflows

How **risky are the cash flows** from both existing assets and growth assets?
Equity: Risk in equity in the company
Firm: Risk in the firm's operations

When will the firm become a **mature firm**, and what are the potential roadblocks?

And Business Drivers that determine value…



DCF as a tool for intrinsic valuation

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

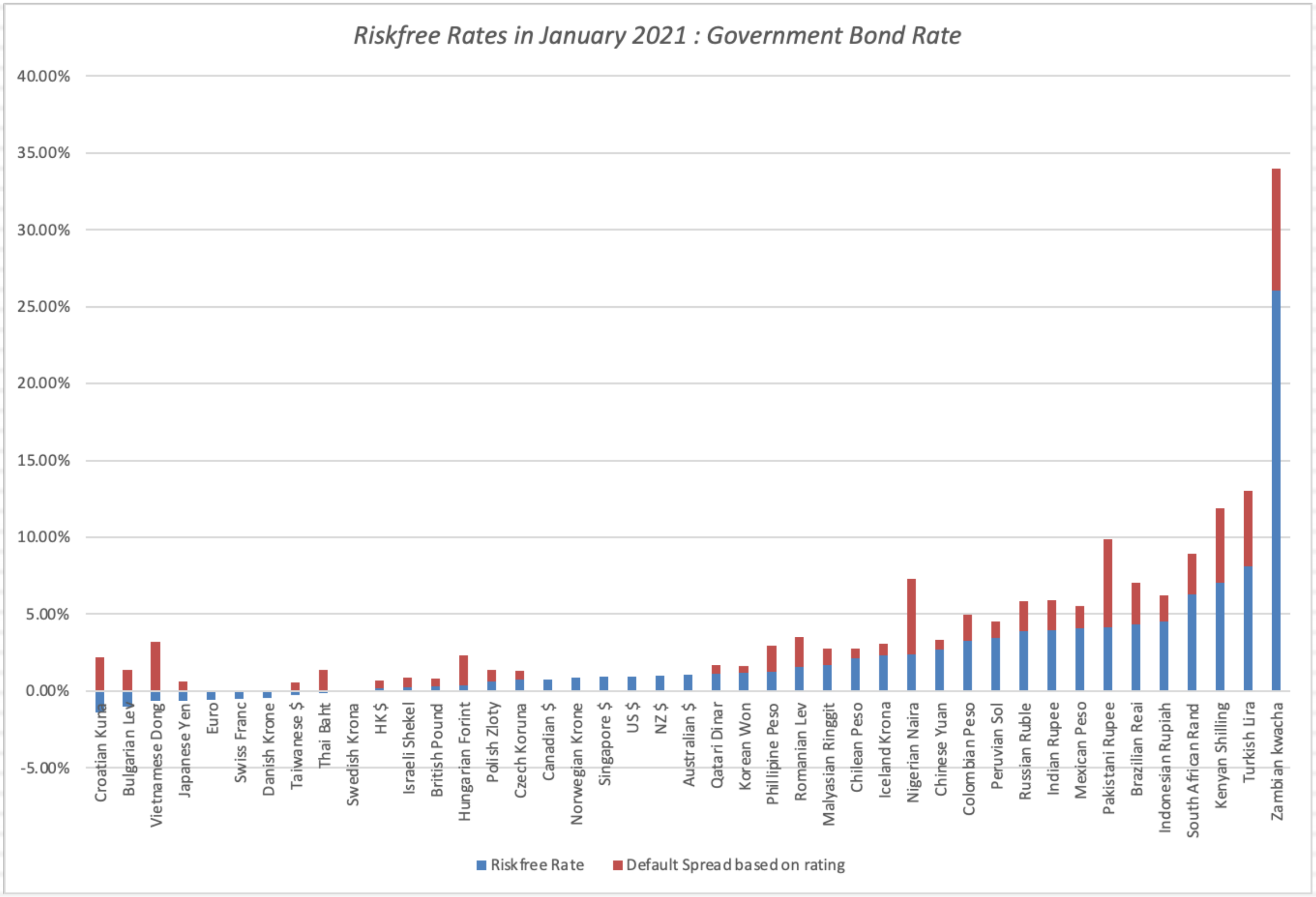
Cash flows from existing assets
The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

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

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

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

1. Match your cash flows to your discount rates..



2. Risk is not in the past..

	Arithmetic Average		*Geometric Average*	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2020	8.28%	6.43%	6.47%	4.84%
Std Error	*2.06%*	*2.18%*		
1971-2020	7.67%	4.90%	6.35%	3.91%
Std Error	*2.38%*	*2.70%*		
2011-2020	13.83%	9.70%	13.24%	9.35%
Std Error	*3.88%*	*4.87%*		

- If you are going to use a historical risk premium, make it
  - Long term (because of the standard error)
  - Consistent with your risk free rate
  - A "compounded" average
- No matter which estimate you use, recognize that it is <u>backward looking</u>, is <u>noisy</u> and may reflect <u>selection bias.</u>

But in the future..

In 2020, COVID caused major drops in both earnings & cash return from 2019 levels

Base year cash flow (last 12 mths)
Dividends (TTM): 58.89
\+ Buybacks (TTM): 68.89
= Cash to investors (TTM): **127.78**

Expected earnings/cashflow growth in next 5 years
Earnings for next year based upon analyst estimates for 2021 and 10.15% growth in earnings from 2021-25, mostly a recovery from COVID drop in 2020.

Actual numbers | Forecasted numbers

	2019	*Last 12 months*	2021	2022	2023	2024	2025	*Terminal Year*
Expected Earnings	$ 163.00	$123.35	138.55	152.62	168.11	185.18	203.98	205.88
Expected cash payout as % of earnings	89.76%	103.59%	89.09%	90.21%	91.33%	92.46%	93.58%	93.58%
Expected Dividends + Buybacks =	$ 146.31	$127.78	$123.43	$137.67	$153.54	$171.21	$190.88	192.66

Earnings and Cash flows grow @0.93% (set equal to risk free rate) a year forever.

S&P 500 on 1/1/21= **3756.07**

$$3756.07 = \frac{123.43}{(1+r)} + \frac{137.67}{(1+r)^2} + \frac{153.54}{(1+r)^3} + \frac{171.21}{(1+r)^4} + \frac{190.88}{(1+r)^5} + \frac{190.88\,(1.0093)}{(r-.0093)(1+r)^5}$$

The last term in this equation is the expected index level at the end of year 5 (capturing price appreciation)

Solve for r

r = Implied Expected Return on Stocks = 5.65%

Minus

Risk free rate = T.Bond rate on 1/1/20= 0.93%

Equals

Implied Equity Risk Premium (1/1/21) = 5.65% - 0.93% = 4.72%

3. Globalization is not a buzz word

- As companies get globalized, the valuations that we do have to reflect that globalization. In particular, we need to be wary of
  - Currency mismatches: Multinationals derive their revenues in many currencies but you have to be currency-consistent.
  - Beta gaming: When a company is listed in many markets, you can get very different betas, depending on how you set up and run a beta regression
  - Equity Risk Premiums: The standard practice of estimating equity risk premiums based on your country of incorporation will lead to skewed valuations.

ERP : Jan 2021

Andorra	Caa1	7.26%	11.98%	Italy	Baa3	2.13%	6.85%
Austria	Aa1	0.38%	5.10%	Jersey	Aaa	0.00%	4.72%
Belgium	Aa3	0.59%	5.31%	Liechtenstein	Aaa	0.00%	4.72%
Cyprus	Ba2	2.91%	7.63%	Luxembourg	Aaa	0.00%	4.72%
Denmark	Aaa	0.00%	4.72%	Malta	A2	0.82%	5.54%
Finland	Aa1	0.38%	5.10%	Netherlands	Aaa	0.00%	4.72%
France	Aa2	0.48%	5.20%	Norway	Aaa	0.00%	4.72%
Germany	Aaa	0.00%	4.72%	Portugal	Baa3	2.13%	6.85%
Greece	Ba3	3.49%	8.21%	Spain	Baa1	1.55%	6.27%
Guernsey	Aaa	0.00%	4.72%	Sweden	Aaa	0.00%	4.72%
Iceland	A2	0.82%	5.54%	Switzerland	Aaa	0.00%	4.72%
Ireland	A2	0.82%	5.54%	Turkey	B2	5.33%	10.05%
Isle of Man	Aa3	0.59%	5.31%	UK	Aa3	0.59%	5.31%
				Western Europe		**0.84%**	**5.56%**

Canada	Aaa	0.00%	4.72%
United States	Aaa	0.00%	4.72%
North America		**0.00%**	**4.72%**

Caribbean		**5.31%**	**10.03%**

Argentina	Ca	11.62%	16.34%
Belize	Caa3	9.68%	14.40%
Bolivia	B2	5.33%	10.05%
Brazil	Ba2	2.91%	7.63%
Chile	A1	0.68%	5.40%
Colombia	Baa2	1.84%	6.56%
Costa Rica	B2	5.33%	10.05%
Ecuador	Caa3	9.68%	14.40%
El Salvador	B3	6.30%	11.02%
Guatemala	Ba1	2.42%	7.14%
Honduras	B1	4.36%	9.08%
Mexico	Baa1	1.55%	6.27%
Nicaragua	B3	6.30%	11.02%
Panama	Baa1	1.55%	6.27%
Paraguay	Ba1	2.42%	7.14%
Peru	A3	1.16%	5.88%
Suriname	Caa3	9.68%	14.40%
Uruguay	B1	4.36%	9.08%
Venezuela	C	19.18%	23.90%
Latin America		**3.99%**	**8.71%**

n

Country	Rating	CRP	ERP
Angola	Caa1	7.26%	11.98%
Benin	B2	5.33%	10.05%
Botswana	A2	0.82%	5.54%
Burkina Faso	B2	5.33%	10.05%
Cameroon	B2	5.33%	10.05%
Cape Verde	B2	5.33%	10.05%
Congo (DR)	Caa1	7.26%	11.98%
Congo (Rep of)	Caa2	8.72%	13.44%
Côte d'Ivoire	Ba3	3.49%	8.21%
Egypt	B2	5.33%	10.05%
Ethiopia	B2	5.33%	10.05%
Gabon	Caa1	7.26%	11.98%
Ghana	B3	6.30%	11.02%
Kenya	B2	5.33%	10.05%
Mali	Caa1	7.26%	11.98%
Morocco	Ba1	2.42%	7.14%
Mozambique	Caa2	8.72%	13.44%
Namibia	Ba3	3.49%	8.21%
Niger	B3	6.30%	11.02%
Nigeria	B2	5.33%	10.05%
Rwanda	B2	5.33%	10.05%
Senegal	Ba3	3.49%	8.21%
South Africa	Ba2	2.91%	7.63%
Swaziland	B3	6.30%	11.02%
Tanzania	B2	5.33%	10.05%
Togo	B3	6.30%	11.02%
Tunisia	B2	5.33%	10.05%
Uganda	B2	5.33%	10.05%
Zambia	Ca	11.62%	16.34%
Africa		**4.94%**	**9.66%**

Albania	B1	4.36%	9.08%
Armenia	Ba3	3.49%	8.21%
Azerbaijan	Ba2	2.91%	7.63%
Belarus	B3	6.30%	11.02%
Bosnia & Herzegovina	B3	6.30%	11.02%
Bulgaria	Baa1	1.55%	6.27%
Croatia	Ba1	2.42%	7.14%
Czech Republic	Aa3	0.59%	5.31%
Estonia	A1	0.68%	5.40%
Georgia	Ba2	2.91%	7.63%
Hungary	Baa3	2.13%	6.85%
Kazakhstan	Baa3	2.13%	6.85%
Kyrgyzstan	B2	5.33%	10.05%
Latvia	A3	1.16%	5.88%
Lithuania	A3	1.16%	5.88%
Macedonia	Ba3	3.49%	8.21%
Moldova	B3	6.30%	11.02%
Montenegro	B1	4.36%	9.08%
Poland	A2	0.82%	5.54%
Romania	Baa3	2.13%	6.85%
Russia	Baa3	2.13%	6.85%
Serbia	Ba3	3.49%	8.21%
Slovakia	A2	0.82%	5.54%
Slovenia	A3	1.16%	5.88%
Tajikistan	B3	6.30%	11.02%
Ukraine	B3	6.30%	11.02%
Uzbekistan	Baa2	1.84%	6.56%
E. Europe & Russia		**2.08%**	**6.80%**

Abu Dhabi	Aa2	0.48%	5.20%
Bahrain	B2	5.33%	10.05%
Iraq	Caa1	7.26%	11.98%
Israel	A1	0.68%	5.40%
Jordan	B1	4.36%	9.08%
Kuwait	A1	0.68%	5.40%
Lebanon	C	19.18%	23.90%
Oman	Ba3	3.49%	8.21%
Qatar	Aa3	0.59%	5.31%
Ras Al Khaima	Aaa	0.00%	4.72%
Saudi Arabia	A1	0.68%	5.40%
Sharjah	Baa2	1.84%	6.56%
United Arab Emirates	Aa2	0.48%	5.20%
Middle East		**1.53%**	**6.25%**

Country	PRS	CRP	ERP
Algeria	57.25	8.72%	13.44%
Brunei	80	0.82%	5.54%
Gambia	63.75	6.30%	11.02%
Guinea	53.5	11.62%	16.34%
Guinea-Bissau	62	7.26%	11.98%
Guyana	65.75	5.33%	10.05%
Haiti	52.75	11.62%	16.34%
Iran	59.25	8.72%	13.44%
Korea, D.P.R.	50.75	11.62%	16.34%
Liberia	53.5	11.62%	16.34%
Libya	58.25	8.72%	13.44%
Madagascar	63.25	6.30%	11.02%
Malawi	58.75	8.72%	13.44%
Myanmar	63.75	6.30%	11.02%
Sierra Leone	58.75	8.72%	13.44%
Somalia	50.5	11.62%	16.34%
Sudan	38.25	19.18%	23.90%
Syria	47	19.18%	23.90%
Yemen, Republic	50	19.18%	23.90%
Zimbabwe	52.25	11.62%	16.34%

Bangladesh	Ba3	3.49%	8.21%
Cambodia	B2	5.33%	10.05%
China	A1	0.68%	5.40%
Fiji	Ba3	3.49%	8.21%
Hong Kong	Aa3	0.59%	5.31%
India	Baa3	2.13%	6.85%
Indonesia	Baa2	1.84%	6.56%
Japan	A1	0.68%	5.40%
Korea	Aa2	0.48%	5.20%
Laos	Caa2	8.72%	13.44%
Macao	Aa3	0.59%	5.31%
Malaysia	A3	1.16%	5.88%
Maldives	B3	6.30%	11.02%
Mauritius	Baa1	1.55%	6.27%
Mongolia	B3	6.30%	11.02%
Pakistan	B3	6.30%	11.02%
Papua New Guinea	B2	5.33%	10.05%
Philippines	Baa2	1.84%	6.56%
Singapore	Aaa	0.00%	4.72%
Solomon Islands	B3	6.30%	11.02%
Sri Lanka	Caa1	7.26%	11.98%
Taiwan	Aa3	0.59%	5.31%
Thailand	Baa1	1.55%	6.27%
Vietnam	Ba3	3.49%	8.21%

Australia	Aaa	0.00%	4.72%
Cook Islands	B1	4.36%	9.08%
New Zealand	Aaa	0.00%	4.72%
Australia & NZ		**0.00%**	**4.72%**

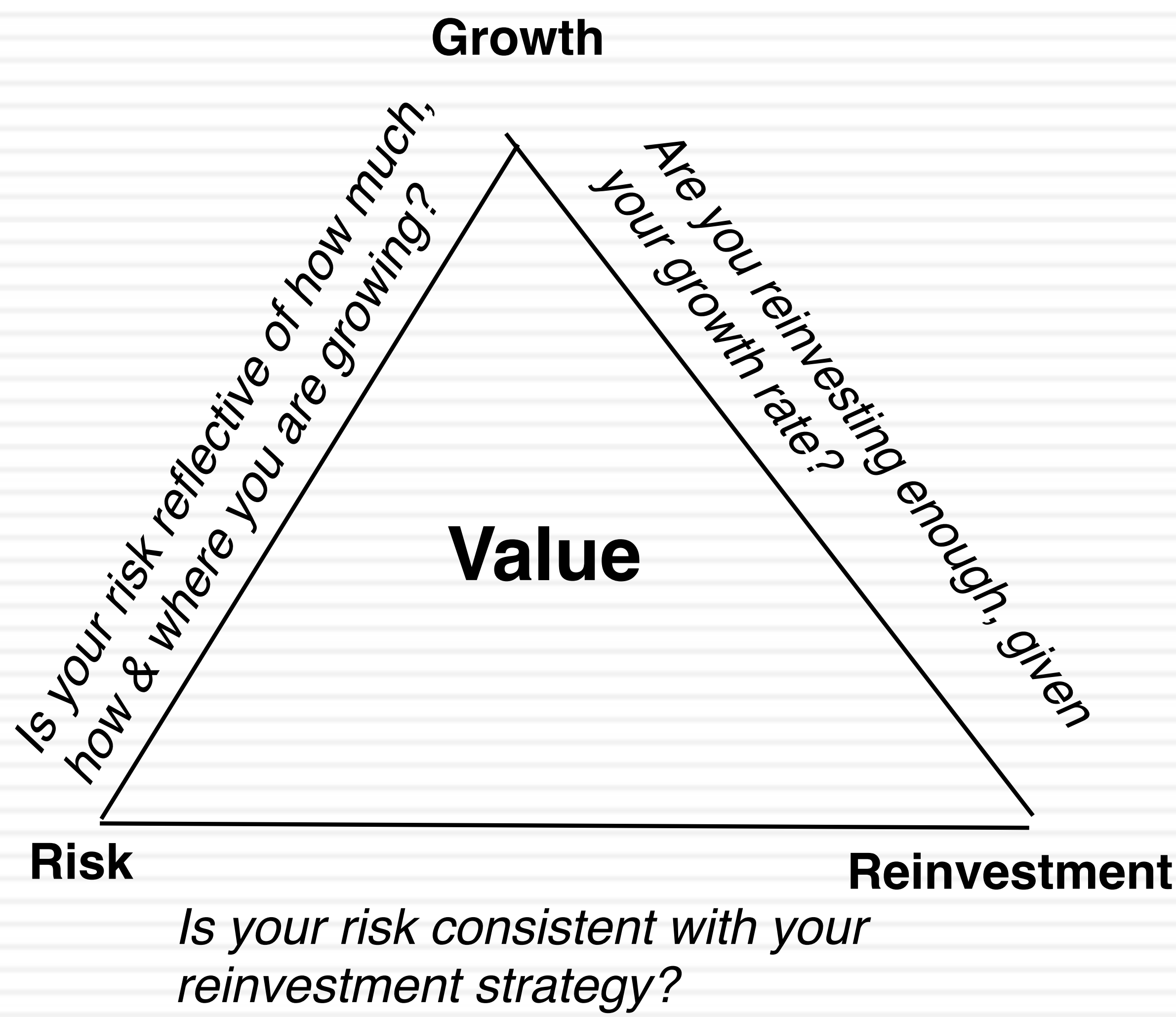
Blue: Moody's Rating
Red: Added Country Risk
Green #: Total ERP

And your country risk exposure comes from where you operate, not where you incorporate!

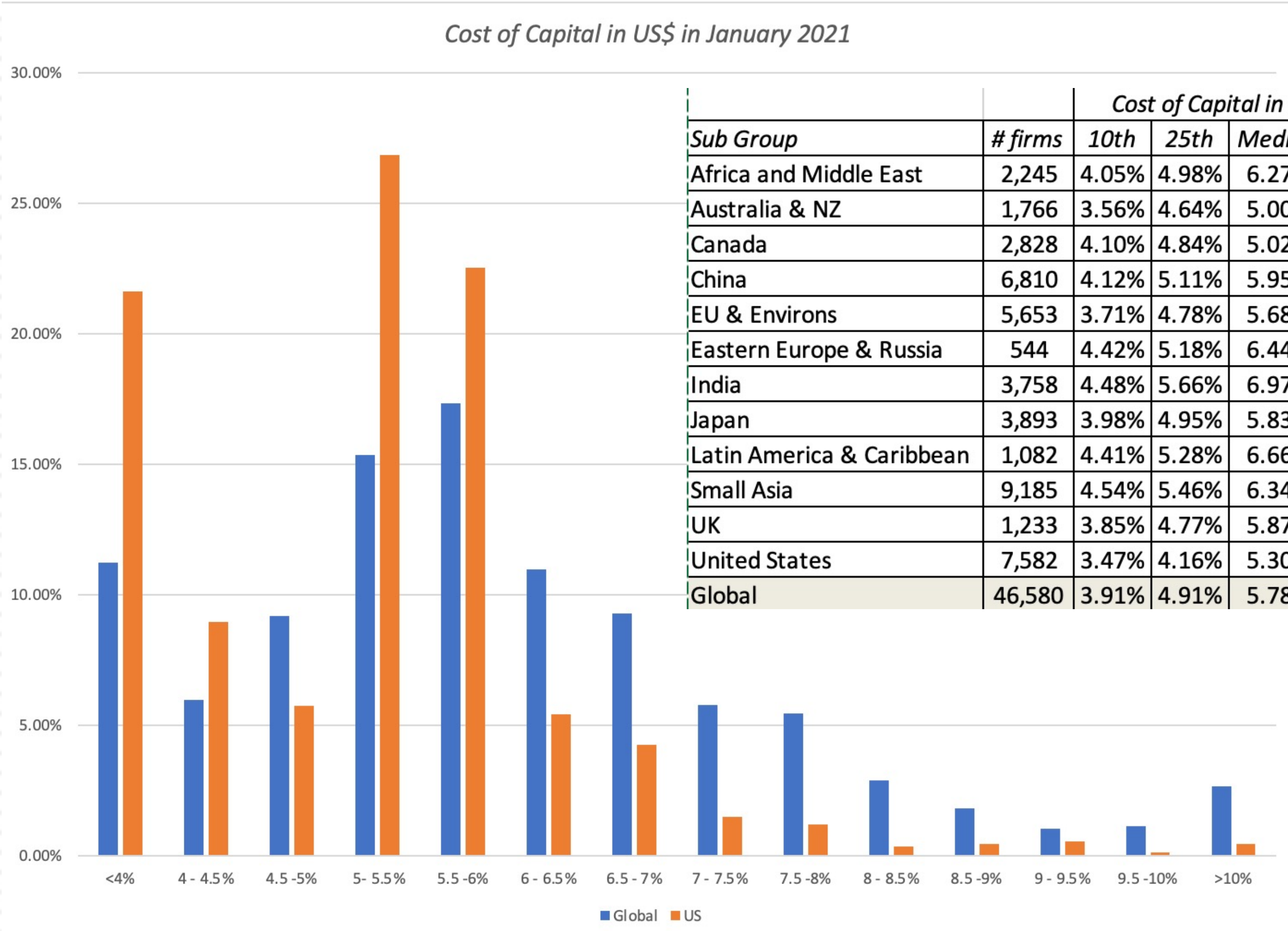
Region	*Revenues*	*ERP*	*Weight*	*Weighted ERP*
North America	₹ 42,408	5.08%	62.01%	3.1499%
Europe	₹ 15,302	6.01%	22.37%	1.3437%
Rest of the World	₹ 8,504	6.21%	12.43%	0.7721%
India	₹ 2,180	7.27%	3.19%	0.2317%
Total	₹ 68,394		100.00%	5.4974%

1. By focusing on revenues, are we misestimating country risk exposure?
2. As the company looks to grow in Latin America and Asia, how do you see this premium evolving?

4. Don't let your inputs be at war with each other..



5. Don't sweat the small stuff



		Cost of Capital in US$: Percentiles				
Sub Group	*# firms*	*10th*	*25th*	*Median*	*75th*	*90th*
Africa and Middle East	2,245	4.05%	4.98%	6.27%	8.01%	10.14%
Australia & NZ	1,766	3.56%	4.64%	5.00%	5.33%	5.93%
Canada	2,828	4.10%	4.84%	5.02%	5.35%	5.98%
China	6,810	4.12%	5.11%	5.95%	6.64%	7.60%
EU & Environs	5,653	3.71%	4.78%	5.68%	6.72%	8.28%
Eastern Europe & Russia	544	4.42%	5.18%	6.44%	7.67%	8.71%
India	3,758	4.48%	5.66%	6.97%	7.69%	8.25%
Japan	3,893	3.98%	4.95%	5.83%	6.44%	7.03%
Latin America & Caribbean	1,082	4.41%	5.28%	6.66%	8.29%	10.92%
Small Asia	9,185	4.54%	5.46%	6.34%	7.51%	8.94%
UK	1,233	3.85%	4.77%	5.87%	6.37%	6.81%
United States	7,582	3.47%	4.16%	5.30%	5.73%	6.32%
Global	46,580	3.91%	4.91%	5.78%	6.73%	7.90%

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

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

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

Maturty and Closure

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

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

Rupee Cashflows

	Base year	1	2	3	4	5
Revenue growth rate		10.00%	10.00%	10.00%	10.00%	10.00%
Revenues	₹ 683,119	₹ 751,431	₹ 826,574	₹ 909,231	₹ 1,000,155	₹ 1,100,170
EBIT (Operating) margin	24.29%	24.16%	24.03%	23.90%	23.78%	23.65%
EBIT (Operating income)	₹ 165,945	₹ 181,568	₹ 198,657	₹ 217,348	₹ 237,790	₹ 260,148
Tax rate	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%
EBIT(1-t)	₹ 119,480	₹ 130,729	₹ 143,033	₹ 156,491	₹ 171,209	₹ 187,306
- Reinvestment		₹ 37,842	₹ 41,626	₹ 45,789	₹ 50,368	₹ 55,404
FCFF		₹ 92,887	₹ 101,407	₹ 110,702	₹ 120,841	₹ 131,902
Cost of capital		11.02%	11.02%	11.02%	11.02%	11.02%
Cumulated discount factor		0.9007	0.8113	0.7307	0.6581	0.5928
PV(FCFF)		₹ 83,664	₹ 82,268	₹ 80,890	₹ 79,531	₹ 78,190

	6	7	8	9	10	Terminal year
Revenue growth rate	9.08%	8.15%	7.23%	6.30%	5.38%	5.38%
Revenues	₹ 1,200,021	₹ 1,297,847	₹ 1,391,656	₹ 1,479,386	₹ 1,558,976	₹ 1,642,849
EBIT (Operating) margin	23.52%	23.39%	23.26%	23.13%	23.00%	23.00%
EBIT (Operating income)	₹ 282,208	₹ 303,536	₹ 323,678	₹ 342,170	₹ 358,565	₹ 377,855
Tax rate	28.40%	28.80%	29.20%	29.60%	30.00%	30.00%
EBIT(1-t)	₹ 202,061	₹ 216,118	₹ 229,164	₹ 240,888	₹ 250,995	₹ 264,499
- Reinvestment	₹ 55,313	₹ 54,191	₹ 51,966	₹ 48,599	₹ 44,090	₹ 94,867
FCFF	₹ 146,747	₹ 161,927	₹ 177,198	₹ 192,289	₹ 206,905	₹ 169,632
Cost of capital	10.80%	10.57%	10.34%	10.11%	9.88%	
Cumulated discount factor	0.5350	0.4839	0.4386	0.3983	0.3625	
PV(FCFF)	₹ 78,514	₹ 78,356	₹ 77,712	₹ 76,588	₹ 74,999	

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**

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

X

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%**

III. Don't mistake modeling for valuation

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

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

A Good Valuation

The Numbers People ⟷ The Narrative People

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

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

From story to numbers and beyond..

Step 1: Develop a narrative for the business that you are valuing
In the narrative, you tell your story about how you see the business evolving over time. Keep it simple & focused.

Step 2: Test the narrative to see if it is possible, plausible and probable
There are lots of possible narratives, not all of them are plausible and only a few of them are probable. No fairy tales or runaway stories.

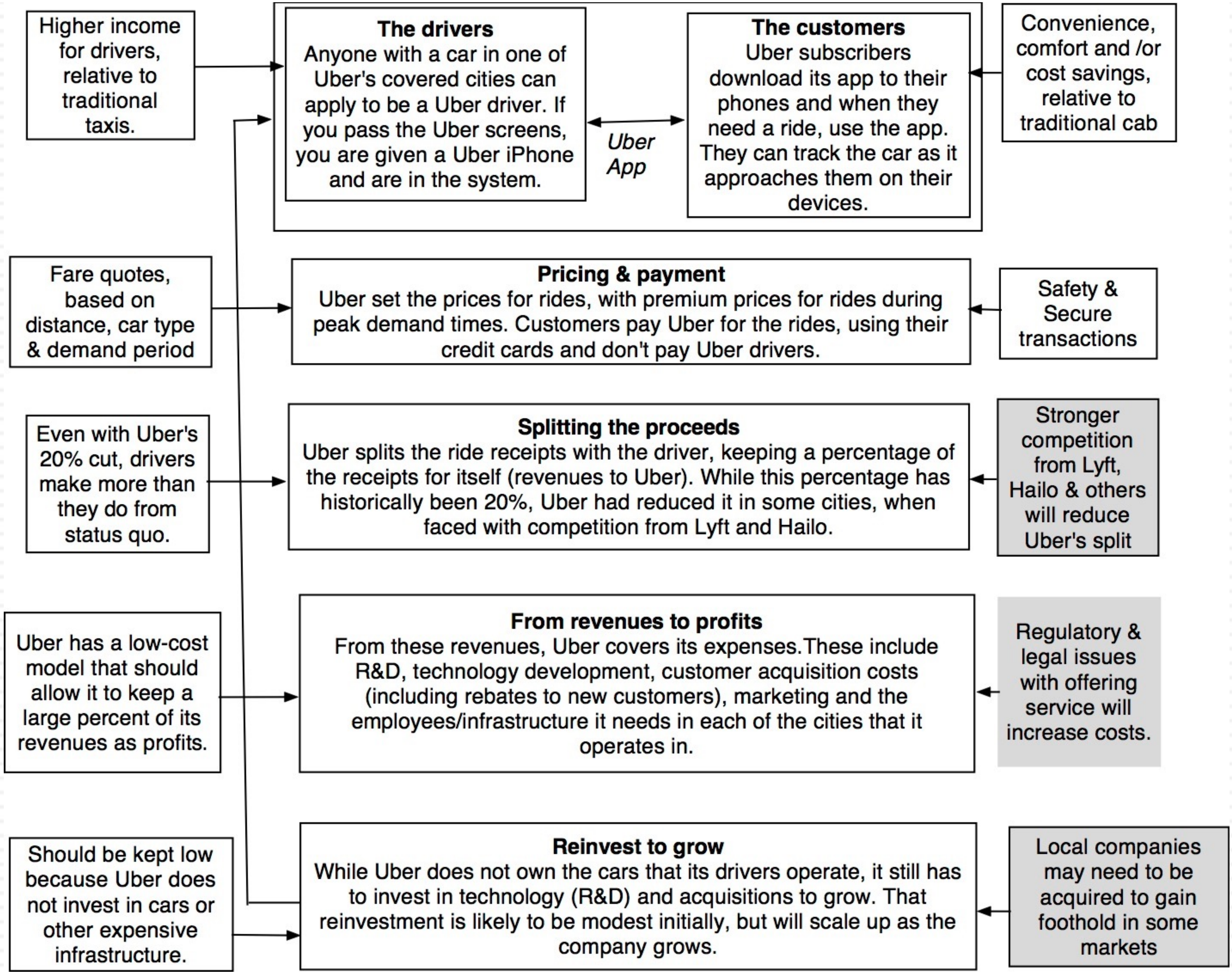
Step 3: Convert the narrative into drivers of value
Take the narrative apart and look at how you will bring it into valuaton inputs starting with potential market size down to cash flows and risk. By the time you are done, each part of the narrative should have a place in your numbers and each number should be backed up a portion of your story.

Step 4: Connect the drivers of value to a valuation
Create an intrinsic valuation model that connects the inputs to an end-value the business.

Step 5: Keep the feedback loop open
Listen to people who know the business better than you do and use their suggestions to fine tune your narrative and perhaps even alter it. Work out the effects on value of alternative narratives for the company.

Step 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.



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

Step 2: Create a narrative for the future

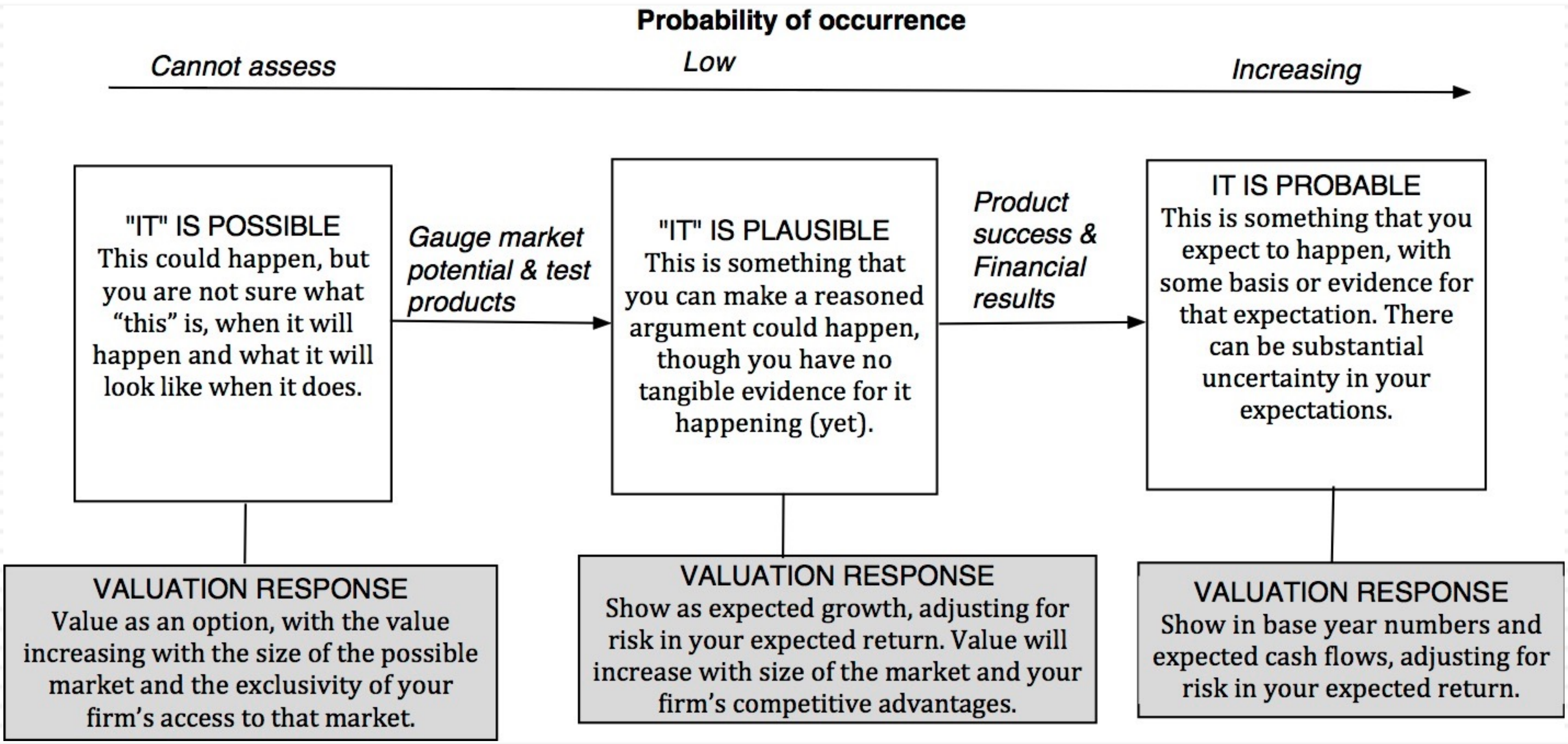
- Every valuation starts with a narrative, a story that you see unfolding for your company in the future.
- In developing this narrative, you will be making assessments of your company (its products, its management), the market or markets that you see it growing in, the competition it faces and will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

The Uber Narrative

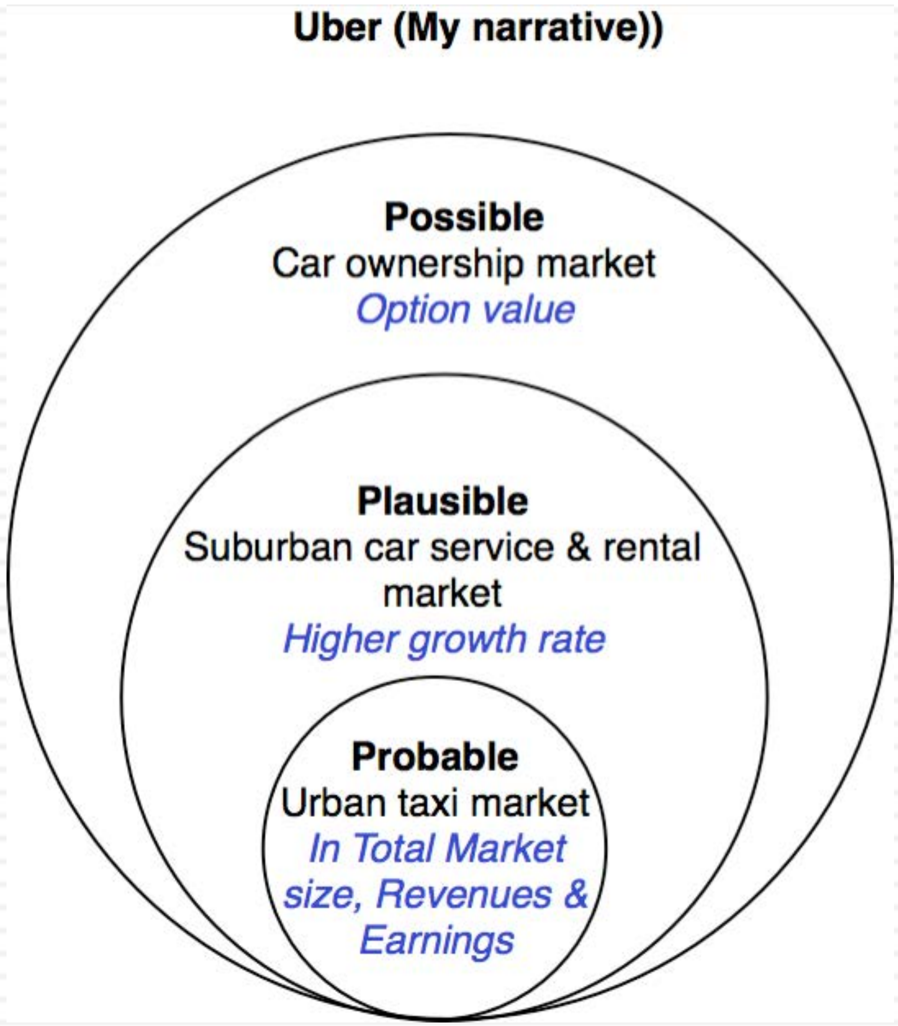
In June 2014, my initial narrative for Uber was that it would be

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.

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

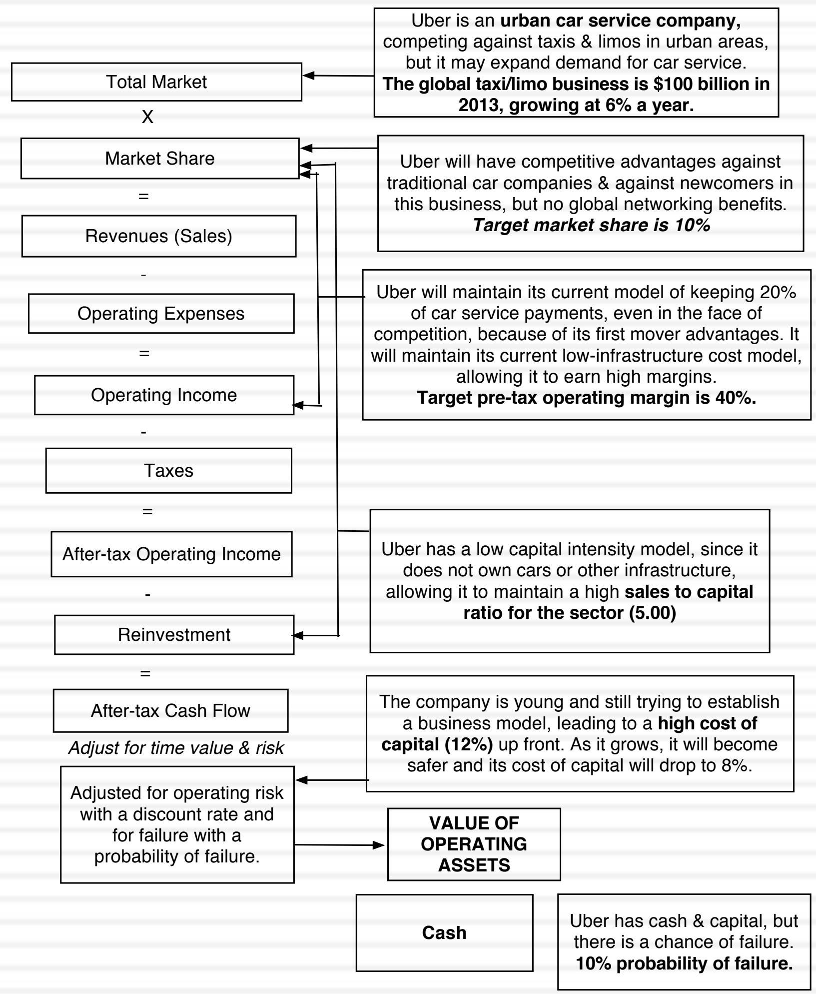


Uber: Possible, Plausible and Probable



Step 4: Connect your narrative to key drivers of value

The Uber narrative (June 2014)



Step 4: Value the company (Uber)

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

Stable Growth (after year 10)
Expected growth rate = 2.50%
Cost of capital = 8%
Return on capital= 25%
Reinvestment Rate= 2.5%/25% = 10%

Terminal Value$_{10}$= 793/(.08-025) = $14,418

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

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

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

Uber's market share of this market will increase to 10% over the next 10 years.

Uber's operating expenses will amount to 60% of its revenues. (Operating margin=40%)

Uber will pay a tax rate of 30% on its income, increasing to 40% over the next 10 years

Uber will generate $5 in incremental revenues for every dollar of incremental capital.

	1	2	3	4	5	6	7	8	9	10
Overall market	$106,000	$112,360	$119,102	$126,248	$133,823	$141,852	$150,363	$159,385	$168,948	$179,085
Share of market (gross)	3.63%	5.22%	6.41%	7.31%	7.98%	8.49%	8.87%	9.15%	9.36%	10.00%
Revenues as percent of gross	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Annual Revenue	$769	$1,173	$1,528	$1,846	$2,137	$2,408	$2,666	$2,916	$3,163	$3,582
Operating margin	7.00%	10.67%	14.33%	18.00%	21.67%	25.33%	29.00%	32.67%	36.33%	40.00%
Operating Income	$54	$125	$219	$332	$463	$610	$773	$953	$1,149	$1,433
Effective tax rate	31%	32%	33%	34%	35%	36%	37%	38%	39%	40%
- Taxes	$17	$40	$72	$113	$162	$220	$286	$362	$448	$573
After-tax operating income	$37	$85	$147	$219	$301	$390	$487	$591	$701	$860
Sales/Capital Ratio	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
- Reinvestment	$94	$81	$71	$64	$58	$54	$52	$50	$49	$84
Free Cash Flow to the Firm	-$57	$4	$76	$156	$243	$336	$435	$541	$652	$776

Based on the investment of $1.2 billion made by investors, the imputed value for Uber's operating assets, in June 2014 ,was $17 billion.

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

Value of operating assets = $6,595

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

Cost of capital for first 5 years = Top decile of US companies = 12%

Cost of capital declines from 12% to 8% from years 6 to 10.

Step 5: Keep the feedback loop open

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

The Uber Feedback Loop: Bill Gurley

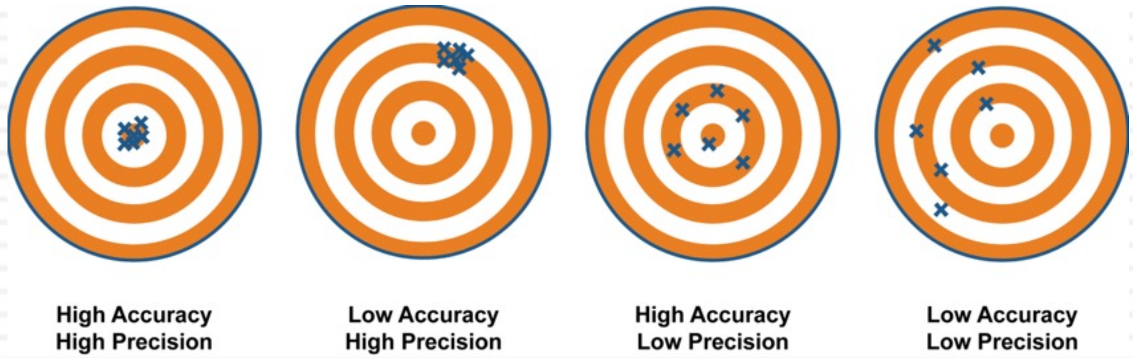
1. Not just car service company.: Uber is a car company, not just a car service company, and there may be a day when consumers will subscribe to a Uber service, rather than own their own cars. It could also expand into logistics, i.e., moving and transportation businesses.
2. Not just urban: Uber can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

Valuing Bill Gurley's Uber narrative

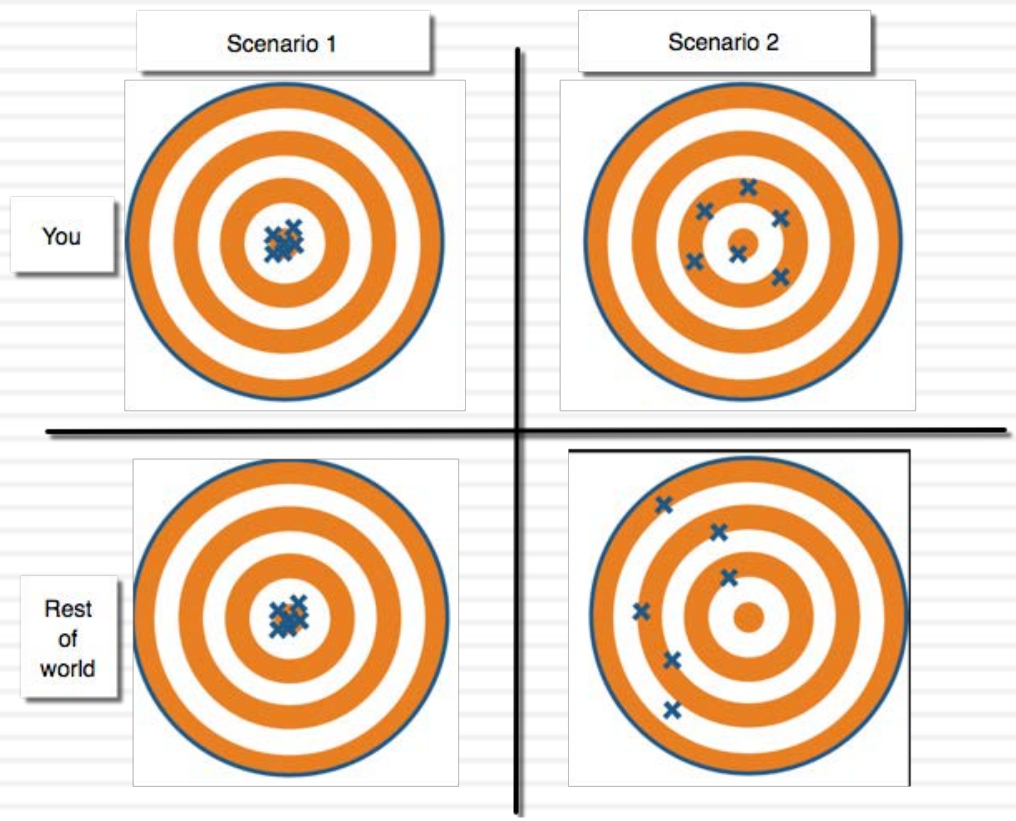
	Uber (Gurley)	*Uber (Gurley Mod)*	*Uber (Damodaran)*
Narrative	Uber will expand the car service market substantially, bringing in mass transit users & non-users from the suburbs into the market, and use its networking advantage to gain a dominant market share, while maintaining its revenue slice at 20%.	Uber will expand the car service market substantially, bringing in mass transit users & non-users from the suburbs into the market, and use its networking advantage to gain a dominant market share, while cutting prices and margins (to 10%).	Uber will expand the car service market moderately, primarily in urban environments, and use its competitive advantages to get a significant but not dominant market share and maintain its revenue slice at 20%.
Total Market	$300 billion, growing at 3% a year	$300 billion, growing at 3% a year	$100 billion, growing at 6% a year
Market Share	40%	40%	10%
Uber's revenue slice	20%	10%	20%
Value for Uber	$53.4 billion + Option value of entering car ownership market ($10 billion+)	$28.7 billion + Option value of entering car ownership market ($6 billion+)	$5.9 billion + Option value of entering car ownership market ($2-3 billion)

IV. Don't mistake precision for accuracy.. And accuracy for payoff..

Better accurate than precise

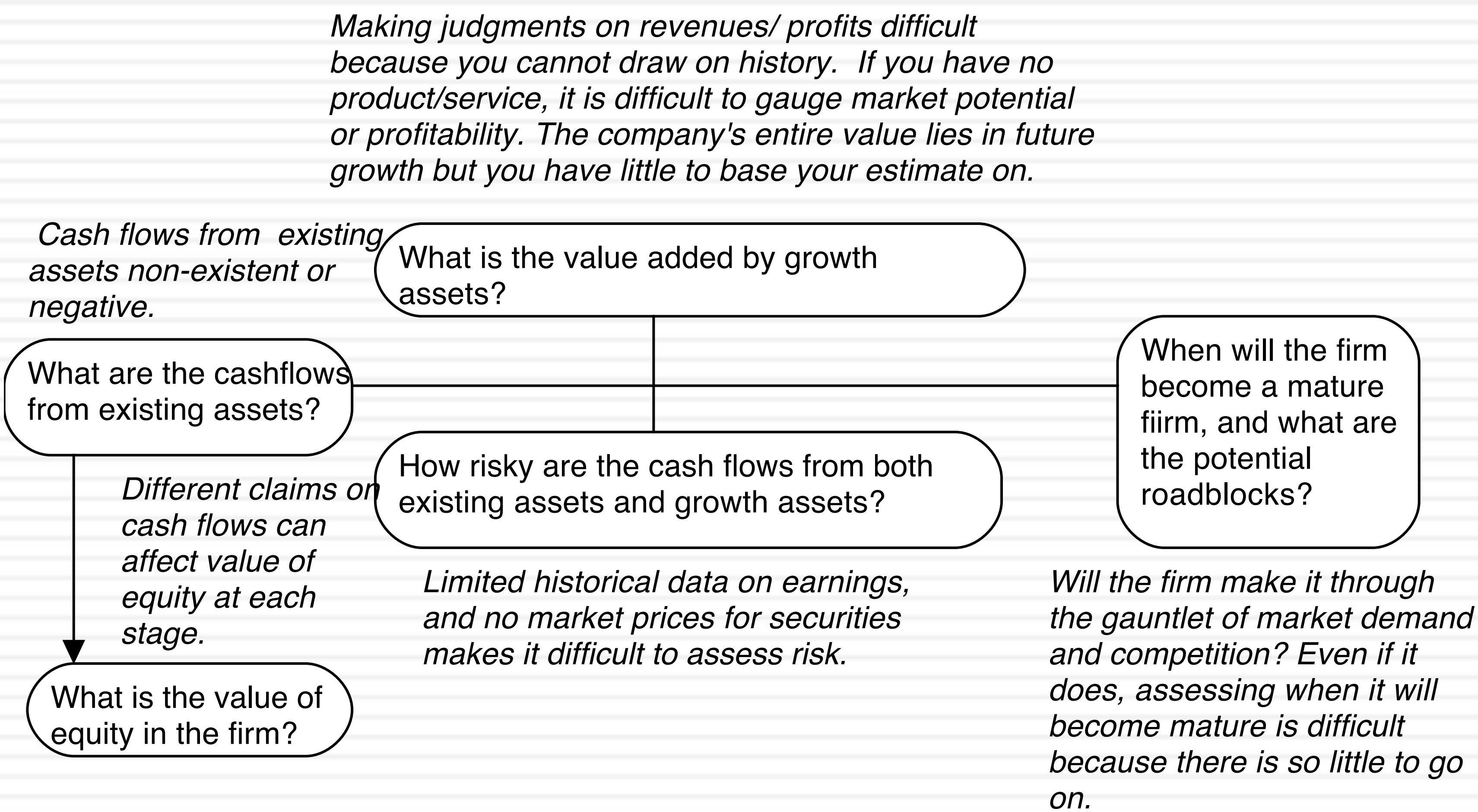


It's all relative



Valuing a start up or a young company is hard to do..

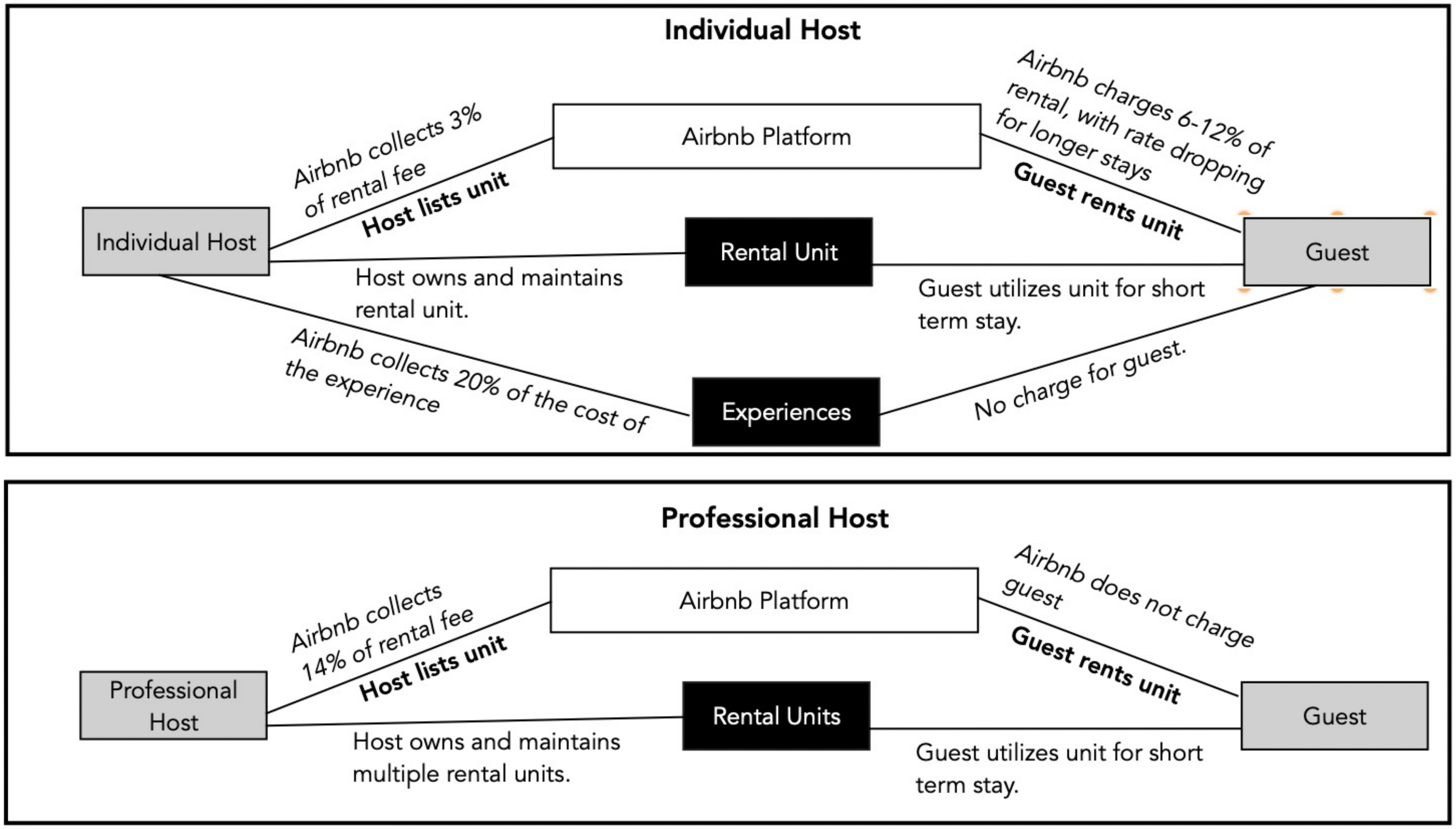
Figure 3: Estimation Issues - Young and Start-up Companies



And the dark side will beckon..

- 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.

Airbnb’s IPO: The Business Model



In 2019, there were 4 million hosts on the platform.

In 2019, there were 5.6 million units listed across 10,000 cities in 220 countries.

In 2019, there were 54 million travellers on the site, who booked 327 milllion nights.

The Airbnb Story

- Continued Growth: Airbnb will continue to grow, while finding a pathway to profitability. Airbnb's growth in gross bookings will come not only from disrupting and taking market share from the hotel business, bad news for conventional hotel companies and travel providers who serves them, but also from continued expansion of non-conventional hospitality providers (home and apartment owners).
- Revenue share stable + Improving margins: As it grows, Airbnb's share of those gross bookings is likely to plateau at close to current levels, but its operating margins will continue to improve towards travel booking industry levels, as product development, marketing and G&A costs decrease, not in dollar terms, but as a percent of revenues.
- Experiences business is tangential: While Airbnb is enthusiastic about the experiences business, it is likely to remain a tangential business, contributing only marginally to revenues and profitability.
- Low Risk, for a young company: Since Airbnb has a light debt load and is closer to profitability than most of the sharing-economy companies that have gone public in recent years

Airbnb	Nov-20

The Story

Airbnb has brought the sharing economy to housing, connecting home owners (hosts) who own units or houses that they want to rent with renters (guests) online, collecting a percentage of the transaction revenues from both sides of the transaction. Its low capital intensity model and extended reach has allowed it to expand not only to expand to almost every part of the world (220 countries) but also provide an unmatched range of offerings. The growth in gross bookings has started to slow down, as the company gets bigger, and the COVID shut downs made 2020 a regressive year. That said, as its competitors in the hotel business have been damaged far more by the crisis, Airbnb will be able to recover quickly from the crisis, and continue on its growth path. Economies of scale will allow for only mild improvements in revenues as a % of gross billings, but the brokerage-based business will generate high margins, in steady state, and require relatively little reinvestment.

The Assumptions

	Base year	*In 2021*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Gross Bookings & Growth Rate	$ 26,491,803.00	*40.00%*	*25.00%* →	→	*2.00%*	Growth continues, as hotels scale back growth plans after COVID shock.
Revenues as % of Gross Bookings	13.69%	12.65%	→	→	14.00%	Mild economies of scale allow slight increase in percent over time
Operating margin (b)	-13.69%	-10.0%	→	→	25.00%	Higher margins than the hotel business, but lower than ad driven businesses.
Tax rate	25.00%	0.00%	→	→	25.00%	Global/US marginal tax rate, after NOLs are used up.
Reinvestment (c)		Sales to Capital =		2.00	20.00%	Low capital intensity business
Return on capital	-25.61%	Marginal ROIC =		65.81%	10.00%	Networking benefits allow for high value growth
Cost of capital (d)			6.50% →	7.12%	7.12%	Cost of capital moves up over time.

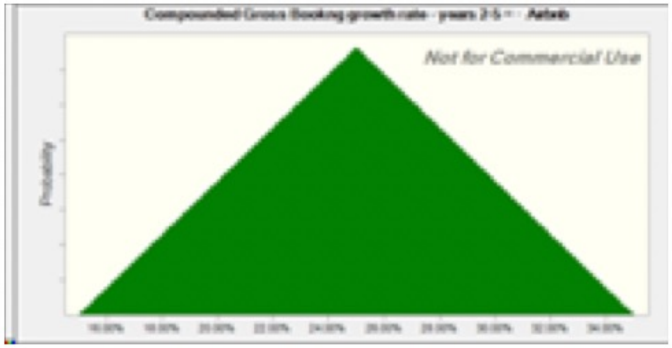
The Cash Flows

	Gross Bookings	*Revenues*	*Operating Margin*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 37,088,524.20	$ 4,691,698	-10.00%	$ (469,170)	$ 532,984	$ (1,002,153)
2	$ 46,360,655.25	$ 5,989,797	-3.00%	$ (179,694)	$ 649,049	$ (828,743)
3	$ 57,950,819.06	$ 7,565,479	0.50%	$ 37,827	$ 787,841	$ (750,014)
4	$ 72,438,523.83	$ 9,554,641	4.00%	$ 382,186	$ 994,581	$ (612,395)
5	$ 90,548,154.79	$ 12,065,542	7.50%	$ 777,799	$ 1,255,450	$ (477,651)
6	$ 109,019,978.36	$ 14,674,089	9.52%	$ 1,047,952	$ 1,304,274	$ (256,322)
7	$ 126,245,134.94	$ 17,163,026	13.39%	$ 1,723,792	$ 1,244,469	$ 479,323
8	$ 140,384,590.06	$ 19,274,804	17.26%	$ 2,495,269	$ 1,055,889	$ 1,439,380
9	$ 149,649,973.00	$ 20,748,969	21.13%	$ 3,288,271	$ 737,082	$ 2,551,189
10	$ 152,642,972.46	$ 21,370,016	25.00%	$ 4,006,878	$ 310,524	$ 3,696,354
Terminal year	$ 155,695,831.91	$ 21,797,416	25.00%	$ 4,087,016	$ 817,403	$ 3,269,612

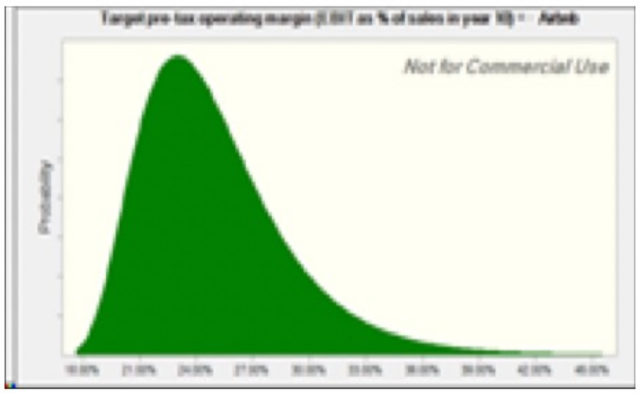
The Value

Terminal value	$ 63,859,619	
PV(Terminal value)	$ 33,434,589	
PV (CF over next 10 years)	$ 1,244,447	
Value of operating assets =	$ 34,679,036	
Adjustment for distress	$ 1,733,952	Probability of failure = 10.00%
- Debt & Minority Interests	$ 2,192,381	
+ IPO Proceeds	$ 3,000,000	Based upon early news stories. May change as final offering details are set.
+ Cash & Other Non-operating assets	$ 4,495,211	
Value of equity	**$ 38,247,914**	
- Value of equity options	$ 1,736,757	
Number of shares	671,064.00	Filler for the moment. Will update when final prospectus is filed
Value per share	$ 54.41	Stock was trading at = *Not yet listed*

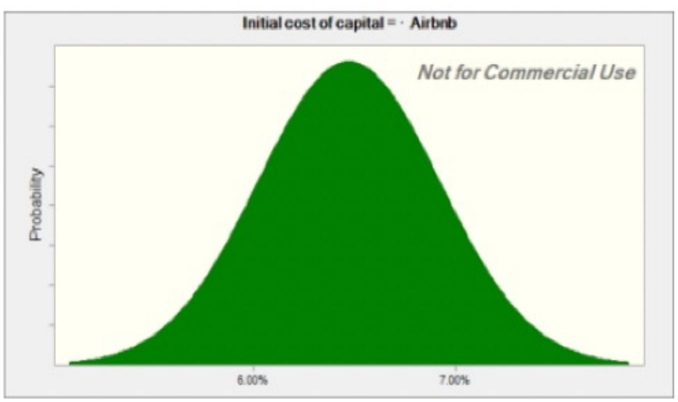
Growth rate in Gross Bookings: 2022-2025
Expected = 25%, Max = 35%, Min = 15%



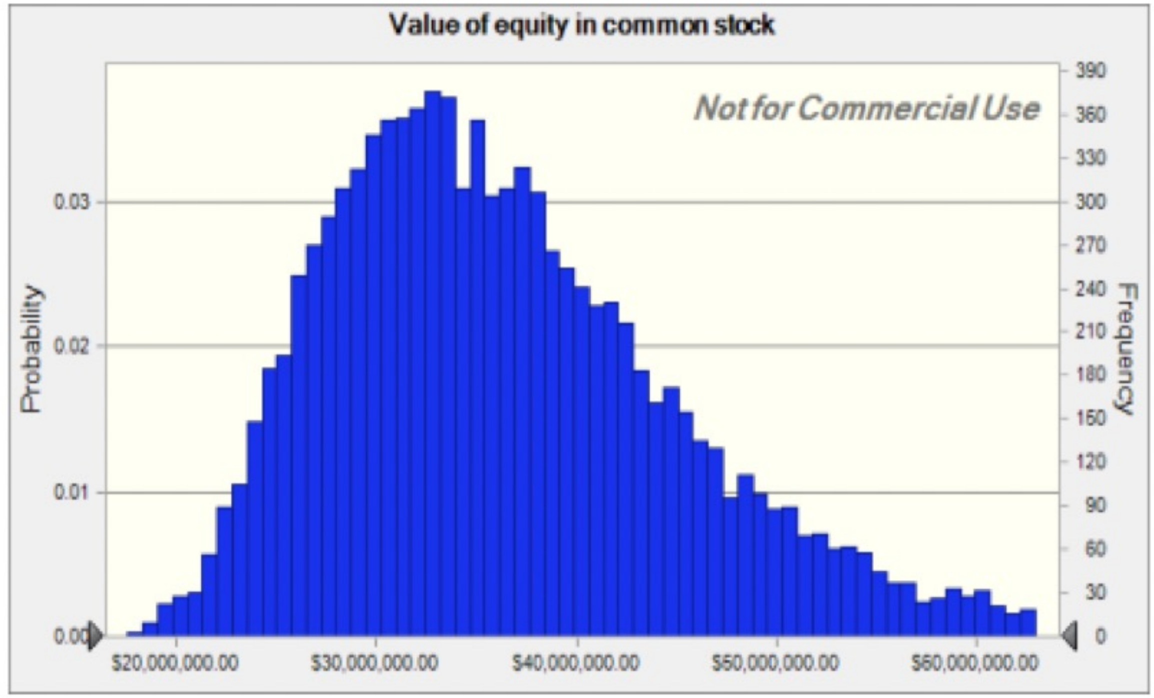
Target Operating Margin in year 10
Expected = 25%, Std Dev = 4%



Cost of Capital (initial)
Expected = 6.50%, Std Dev = 0.45%



Airbnb IPO: Simulation of Equity Value in November 2020



Percentile	*Forecast values*
0%	$17,591,165
10%	$26,150,864
20%	$28,790,133
30%	$30,952,251
40%	$32,981,840
50%	$35,114,898
60%	$37,463,932
70%	$40,181,915
80%	$43,595,272
90%	$49,120,328
100%	$100,382,037

V. Valuation is a craft, and you should never stop learning

- 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 <u>by doing</u>. The more you do it, the better you get at it. **Valuation is a craft.**

Uber's Existing User Value

Growth rate in Operating Expenses
Assumed that 90% of operating expenses are variable, growing at revenue growth rate. Overall expenses grow 10.95%/year

Growth rate in Revenues
Assumed 12% growth in annual revenues/user over next 15 years

User Lifetime
Assumed to be 15 years, with an annual renewal probability of 95%.

	Base Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Membership Survival	1.0000	0.9500	0.9025	0.8574	0.8145	0.7738	0.7351	0.6983	0.6634	0.6302	0.5987	0.5688	0.5404	0.5133	0.4877	0.4633
Gross Billings	$ 547.24	$612.91	$686.46	$768.84	$861.10	$964.43	$1,080.16	$1,209.78	$1,354.95	$1,517.54	$1,699.65	$1,903.61	$2,132.04	$2,387.89	$2,674.43	$2,995.36
Net Revenues	$ 110.16	$123.38	$138.19	$154.77	$173.35	$194.15	$ 217.45	$ 243.54	$ 272.76	$ 305.50	$ 342.16	$ 383.21	$ 429.20	$ 480.70	$ 538.39	$ 602.99
Operating Expenses	$ 65.12	$ 72.25	$ 80.16	$ 88.94	$ 98.67	$109.48	$ 121.47	$ 134.77	$ 149.52	$ 165.90	$ 184.06	$ 204.22	$ 226.58	$ 251.39	$ 278.92	$ 309.46
Operating Profit/user	$ 45.05	$ 51.14	$ 58.03	$ 65.84	$ 74.67	$ 84.67	$ 95.98	$ 108.77	$ 123.24	$ 139.60	$ 158.09	$ 179.00	$ 202.62	$ 229.31	$ 259.47	$ 293.54
Survival adjusted Operating Profit		$ 48.58	$ 52.37	$ 56.45	$ 60.82	$ 65.52	$ 70.55	$ 75.96	$ 81.76	$ 87.98	$ 94.66	$ 101.81	$ 109.49	$ 117.72	$ 126.54	$ 135.99
After-tax Operating Profit/user	$ 33.79	$ 36.44	$ 39.28	$ 42.34	$ 45.62	$ 49.14	$ 52.92	$ 56.97	$ 61.32	$ 65.99	$ 70.99	$ 76.36	$ 82.12	$ 88.29	$ 94.90	$ 101.99
Present Value		$ 33.66	$ 33.53	$ 33.38	$ 33.23	$ 33.07	$ 32.90	$ 32.73	$ 32.55	$ 32.36	$ 32.16	$ 31.96	$ 31.75	$ 31.54	$ 31.32	$ 31.10
Annual Growth Rate (Revenues)	12.00%															
Annual Growth Rate (Op Exp)	10.95%															
Risk-adjusted discount rate	8.24%															
Life of user =	15.00															
Value per existing user =	$ 487.25															
Number of existing users =	91.00															
Value of Existing Users	**$44,339.77**															

Risk Adjusted Discount Rate
Used a 8.24% cost of capital, set at the median cost of capital for US companies, adjusted for inflation difference.

Survival-adjusted PV
PV of after-tax operating income, adjusted for drop out rate over time.

Uber’s New User Value

Value Added by New Users at Uber

Base year Value/ New User
Value of User = $487.25
Cost of adding New User = $113.71
Value added by new user = $373.54

User Growth rates
Years 1-5: 12%
Years 6-10: 6%

Cost of capital
Used 9.97%, the 75th percentile of US companies

Beyond year 10
User growth continues at 2.5% a year

	Base Year	1	2	3	4	5	6	7	8	9	10
Total Users	91.00	101.92	114.15	127.85	143.19	160.37	170.00	180.20	191.01	202.47	214.62
New Users	0.00	15.47	17.33	19.41	21.73	24.34	17.64	18.70	19.82	21.01	22.27
Value per new user	$373.54	$379.14	$384.83	$390.60	$396.46	$402.40	$408.44	$414.57	$420.78	$427.10	$433.50
Value added by new users		$5,865.27	$6,667.64	$7,579.77	$8,616.68	$9,795.45	$7,205.30	$7,752.18	$8,340.57	$8,973.62	$9,654.72
Terminal Value (new users)											$31,603.73
Present Value		**$ 5,333.52**	**$ 5,513.45**	**$ 5,699.46**	**$ 5,891.74**	**$ 6,090.50**	**$ 4,073.87**	**$ 3,985.70**	**$ 3,899.44**	**$ 3,815.05**	**$ 15,950.37**
Value Added by New Users	**$ 60,253.08**										

Existing Users	
Inputs	
Net Revenue/User =	$ 110.16
Operating Expense/User=	$ 65.12
Operating Profit/User =	$ 45.05
CAGR in Revenue/User	12.00%
Annual Renewal Rate =	95.00%
User Life =	15
Discount Rate =	8.24%
Output	
Value/User =	$ 487.25
# Existing Users =	91.00
Value of Existing Users =	**$44,339.77**

Existing users will stick with Uber and increase how much they spend on its services, the longer they stay. Operating expneses are mostly fixed, but there will be mild econmies of scale.

+

New Users	
Inputs	
Cost of acquiring user =	$ 113.71
Value of new user =	$ 373.54
Growth rate in net users (1-5)	12.00%
Growth rate in net users (6-10)	6.00%
Discount Rate	9.97%
Output	
# Users in year 10 =	214.62
# Net New Users (10 years)	123.62
Value of New Users =	**$60,253.08**

Uber will continue to add new users, but at a decreasing pace, with a cost of acquiring a new user staying stable (with the current cost incrteasing at the inflation rate). The new user spending profile will mirror existing users.

-

Corporate Expenses	
Inputs	
Corporate Expenses	$ 2,812.72
CAGR - Next 10 years	7.00%
Discount Rate =	8.24%
Output	
PV of Corporate Expenses	**$(63,216.48)**

Uber's corporate expenses will continue to grow, notwithstanding economies of scale, as the company increases spending moderately on autonomous cars.

=

Value of Operating A	$41,376.37
+ Cash	$15,407.00
+ Cross Holdings	$ 8,700.00
- Debt	$ 6,869.00
Value of equity	**$58,614.37**
# Shares	1158.30
Value/Share	**$ 50.60**

VI. Don’t mistake price for value!

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

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

Accounting Estimates

Valuation Estimates

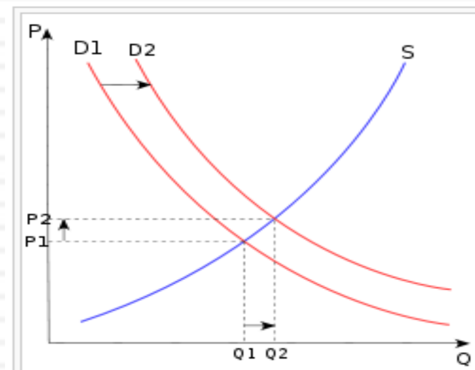
INTRINSIC VALUE

Value

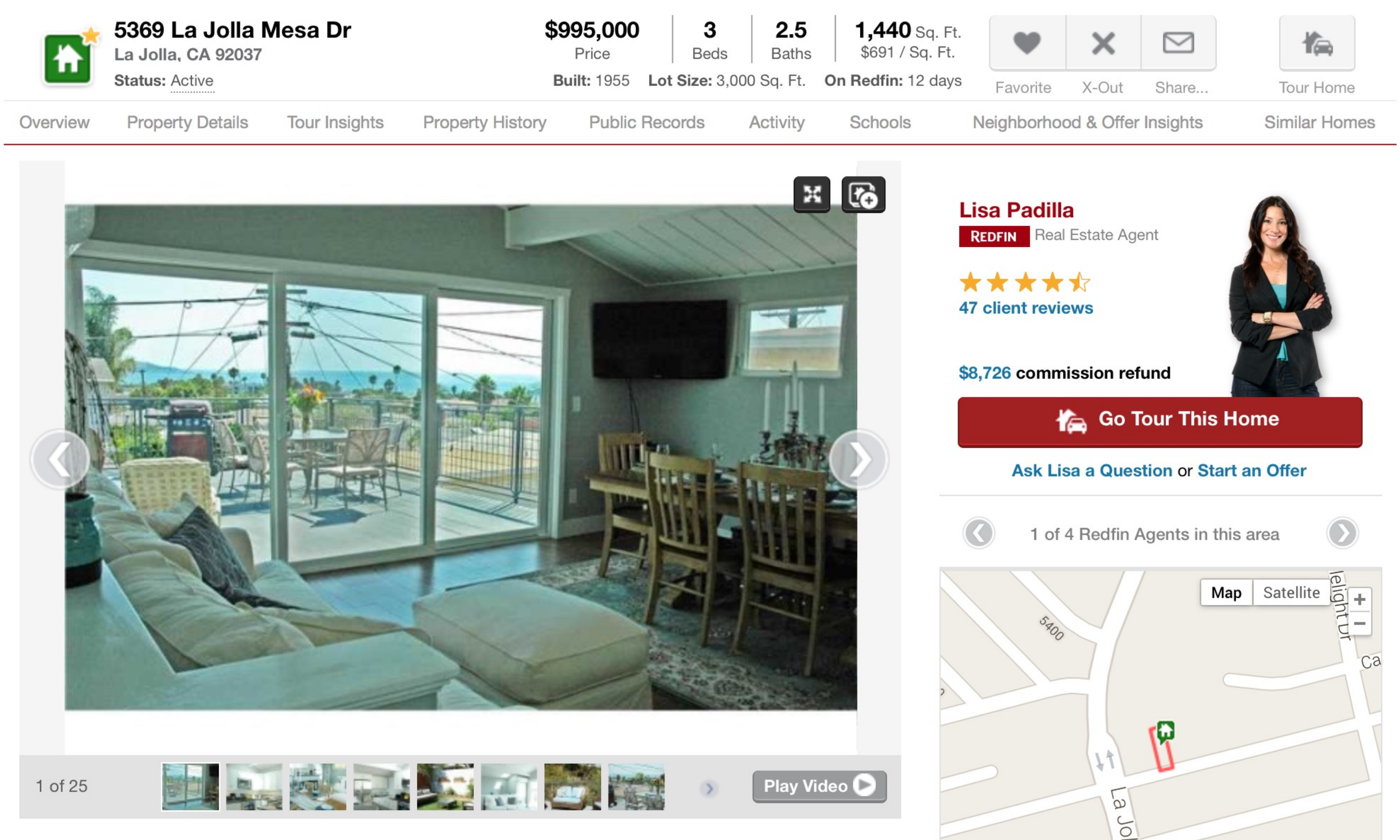
THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Price

PRICE



Are you pricing or valuing?



The determinants of price

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

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

The Market Price

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

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

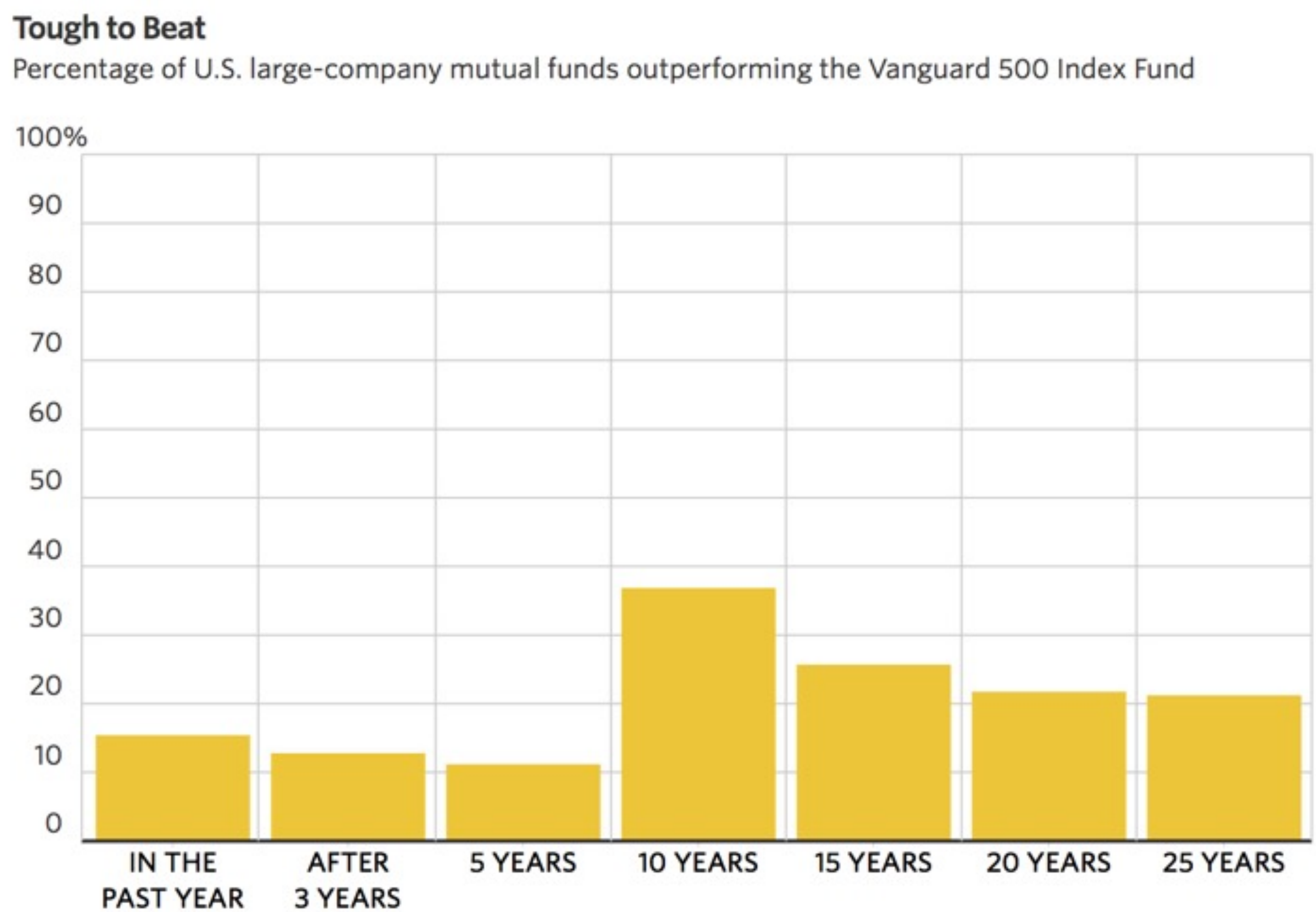
Value versus Price

	To value	To price
Assets	Can be valued based upon expected cashflows, with higher cashflows & lower risk = higher value.	Can be priced against similar assets, after controlling for cash flows and risk.
Commodity	Can be valued, based upon utilitarian demand and supply, but with long lags in both.	Can be priced against its own history (normalized price over time)
Currency	Cannot be valued	Can be priced against other currencies, with greater acceptance & more stable purchasing power = higher price.
Collectible	Cannot be valued	Can be priced based upon scarcity and desirability.

VII. Investing is an act of faith..

- When investing, we are often told that if you are virtuous (careful in your research, good at valuation, have a long time horizon), you will be rewarded (with high returns).
- That pitch is amplified by anecdotal evidence of righteous ones, i.e., those who have followed the path to success.
- Those who chose not to be virtuous are labeled as “speculators”, viewed as shallow and deserving of the fate that awaits them.
- If you have faith in investing, you will be tested.

Active Investing is a loser's game

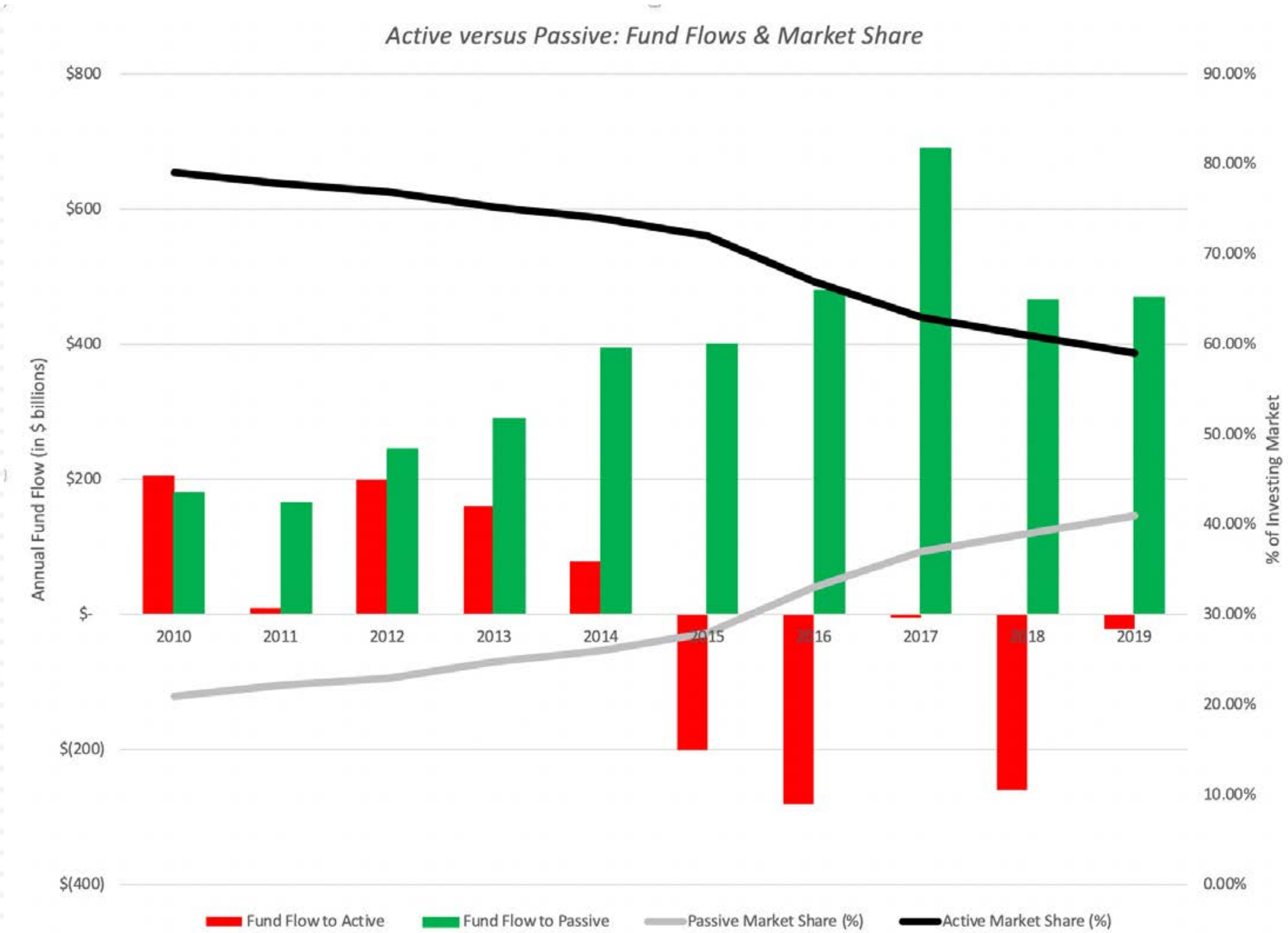


And it stays that way across styles..

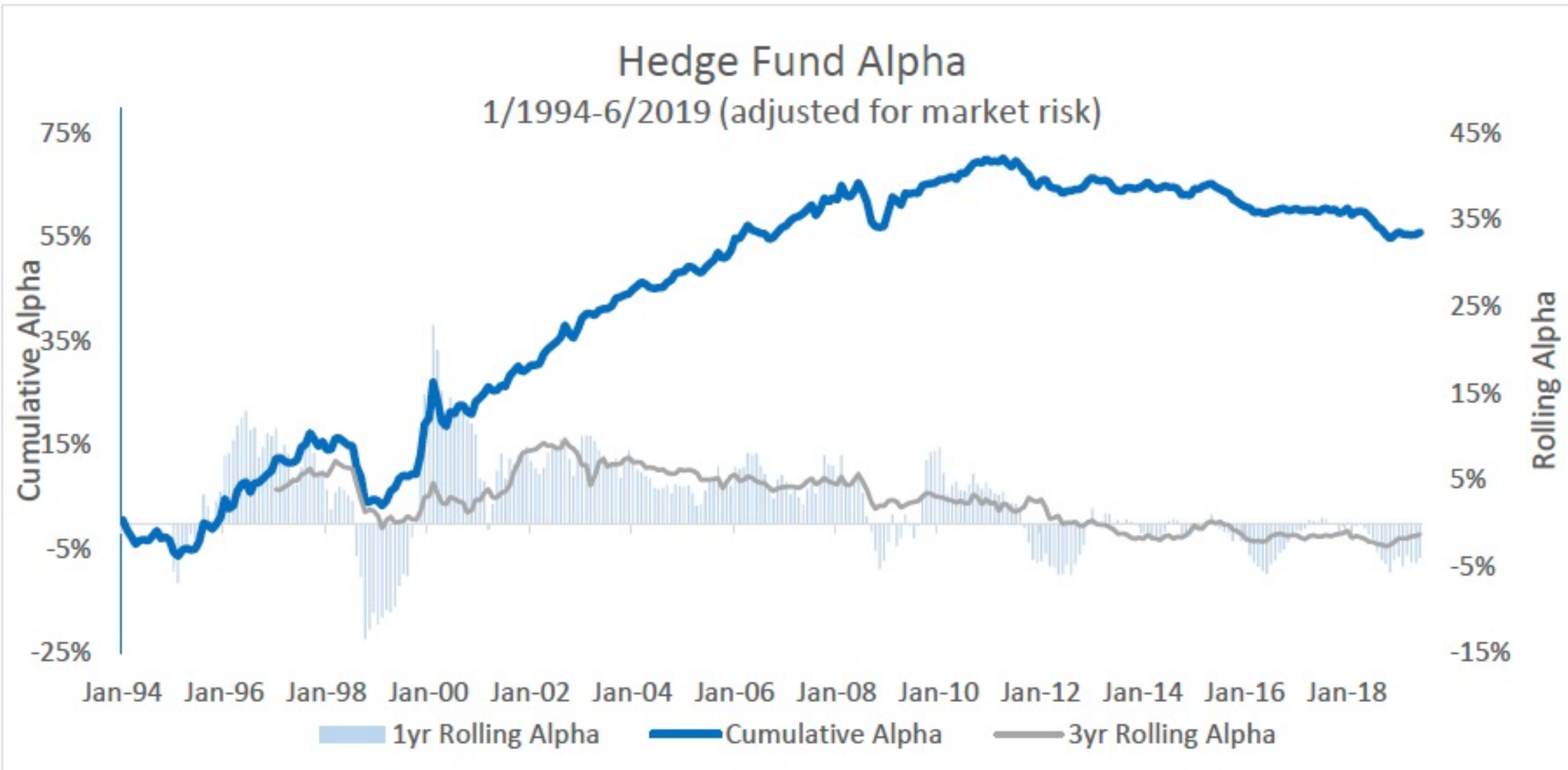
	% of US Mutual Funds that beat their respective indices			
	Value	Growth	Core	All
Large	82.17%	86.54%	88.26%	84.15%
Mid-cap	70.27%	81.48%	76.51%	76.69%
Small	92.31%	91.89%	91.44%	90.13%
All Equity				88.43%
Real Estate				82.64%

S&P computes these percentages for the last year, the last 3 years & the last 10 years. There is not a single period or a single fund grouping where the number is <50%.

The secret is now out in the open…



The "smart" money does not stay smart for very long..



Follow the yellow brick road..