



MY VALUATION JOURNEY: HAVE FAITH, YOU MUST!

July 2019

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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.

The 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

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 <i>Fixed Maturity</i> <i>Tax Deductible</i>
Expected Value that will be created by future investments	Growth Assets	Equity	Residual Claim on cash flows Significant Role in management <i>Perpetual Lives</i>

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 $D+CF = DCF$

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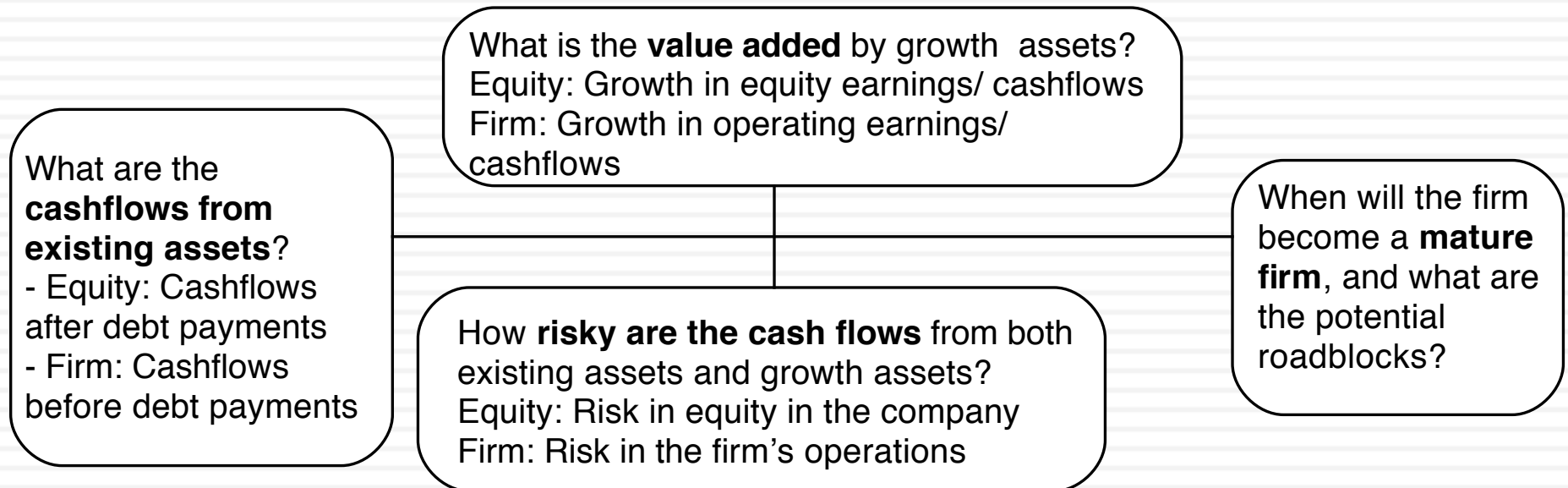
- The value of a risky asset can be estimated by discounting the expected cash flows on the asset over its life at a risk-adjusted discount rate:

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

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

The drivers of value..

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DCF as a tool for intrinsic valuation

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

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

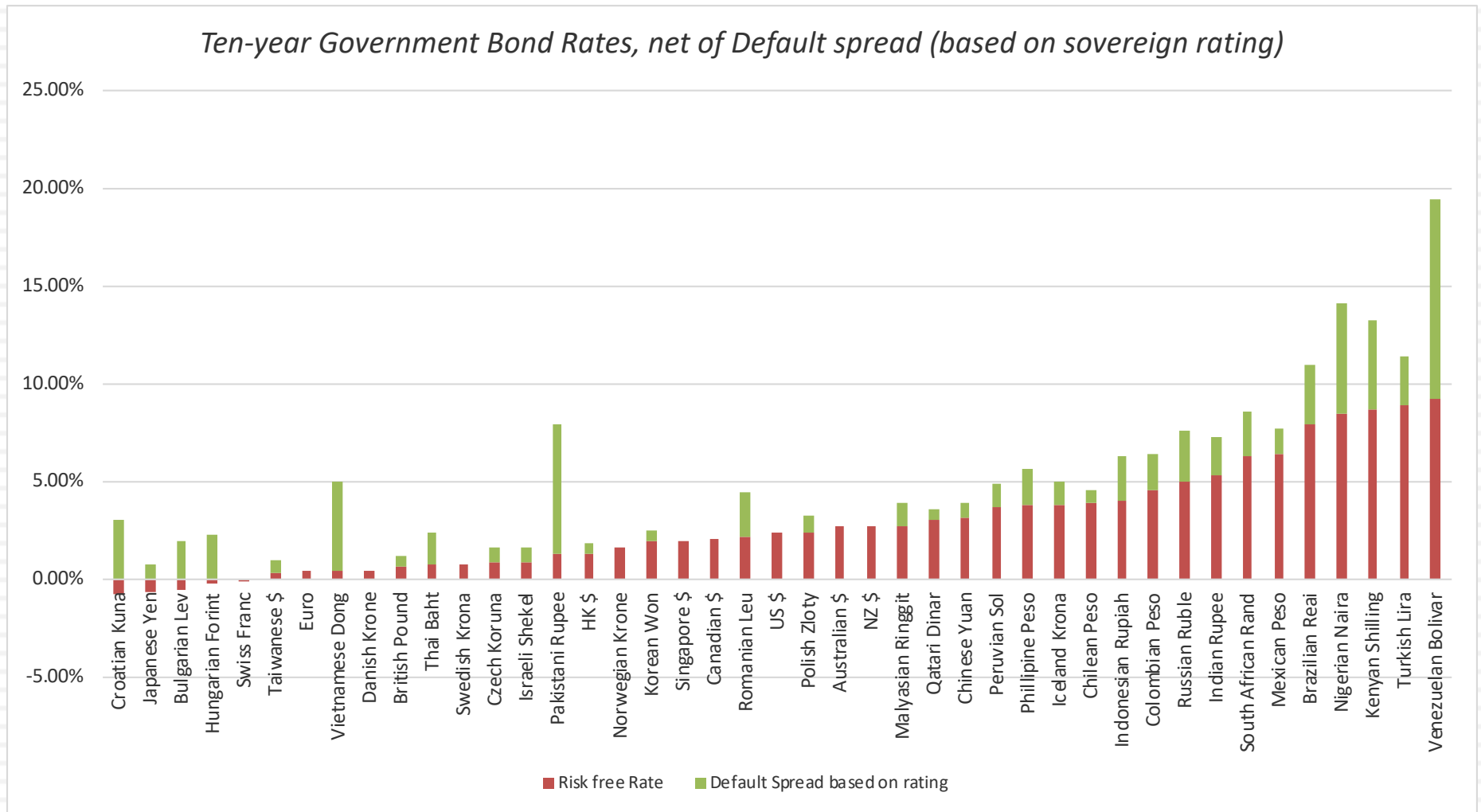
$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} + \dots + \frac{E(CF_n)}{(1+r)^n}$$

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

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

1. Currencies matter

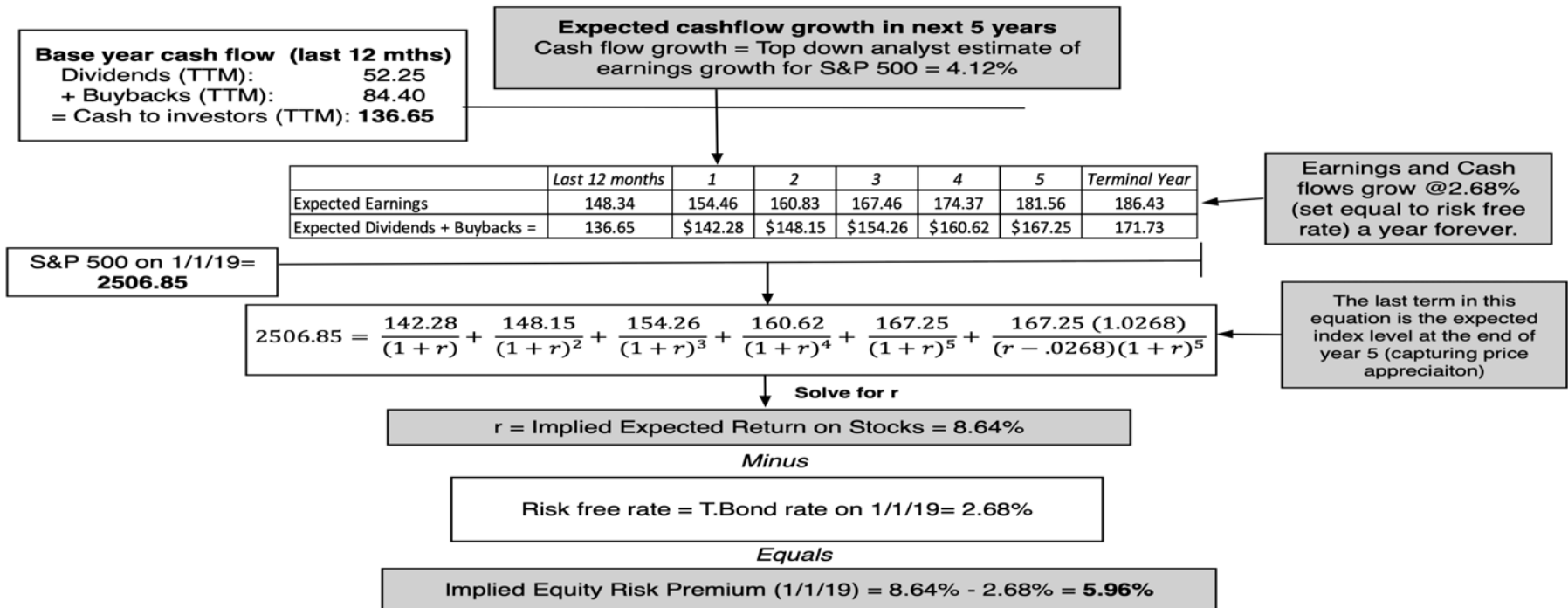
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2. Risk is not in the past, but in the future

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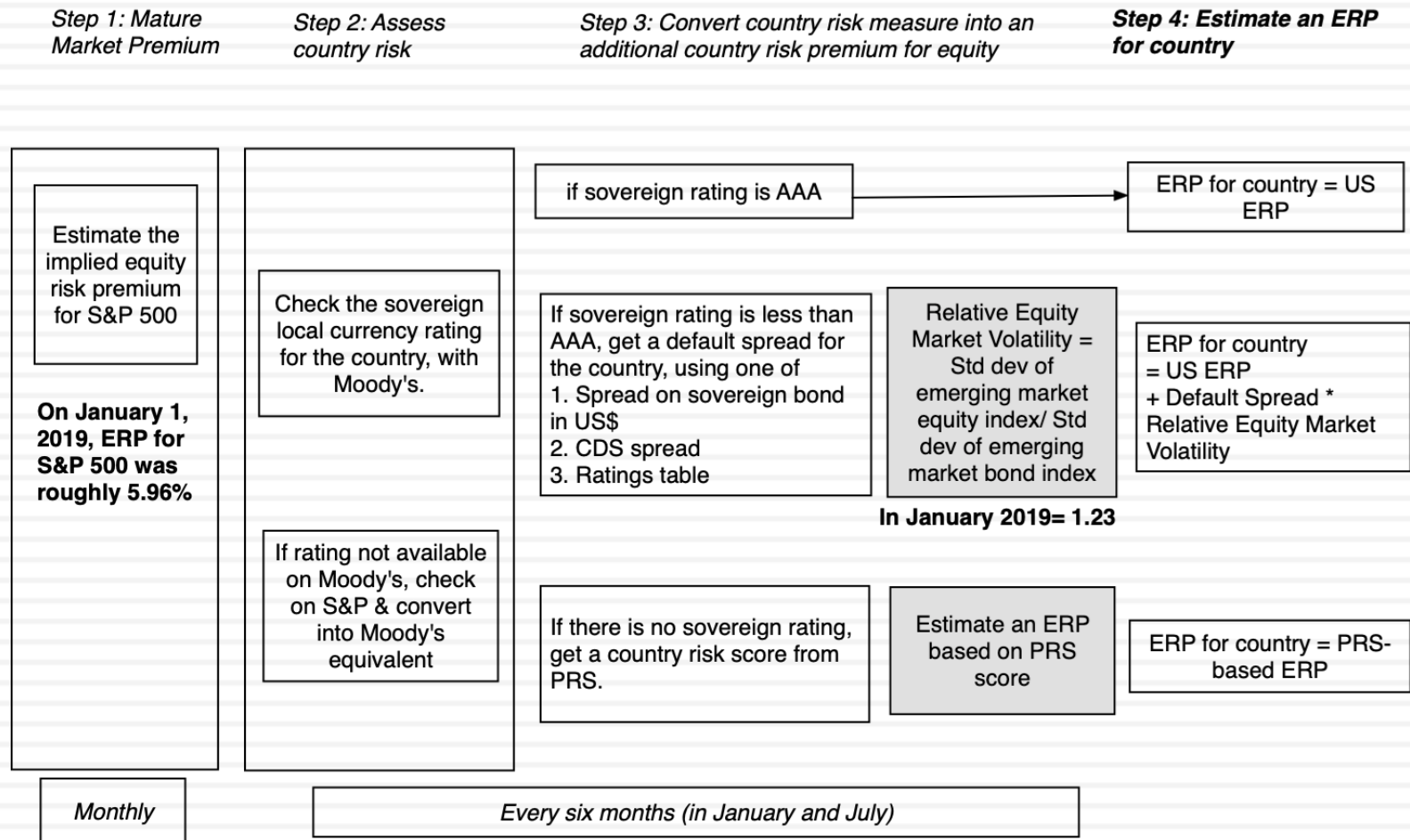
	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2017	8.09%	6.38%	6.26%	4.77%
Std Error	2.10%	2.24%		
1968-2017	6.58%	4.24%	5.28%	3.29%
Std Error	2.39%	2.70%		
2008-2017	9.85%	5.98%	8.01%	4.56%
Std Error	6.12%	8.70%		



3 Globalization is not a buzz word

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ERP Estimation Procedure - January 1, 2019



ERP : Jan 2019

Andorra	8.60%	2.64%	Italy	9.02%	3.06%
Austria	6.51%	0.55%	Jersey (States of)	6.80%	0.84%
Belgium	6.80%	0.84%	Liechtenstein	5.96%	0.00%
Cyprus	10.13%	4.17%	Luxembourg	5.96%	0.00%
Denmark	5.96%	0.00%	Malta	7.63%	1.67%
Finland	6.51%	0.55%	Netherlands	5.96%	0.00%
France	6.65%	0.69%	Norway	5.96%	0.00%
Germany	5.96%	0.00%	Portugal	9.02%	3.06%
Greece	14.99%	9.03%	Spain	8.18%	2.22%
Guernsey (States of)	6.80%	0.84%	Sweden	5.96%	0.00%
Iceland	7.63%	1.67%	Switzerland	5.96%	0.00%
Ireland	7.14%	1.18%	Turkey	10.96%	5.00%
Isle of Man	6.65%	0.69%	United Kingdom	6.65%	0.69%
			Western Europe	7.11%	1.15%

Canada	5.96%	0.00%
United States	5.96%	0.00%
North America	5.96%	0.00%

Caribbean	13.61%	7.65%
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Argentina	13.60%	7.64%
Belize	14.99%	9.03%
Bolivia	10.96%	5.00%
Brazil	10.13%	4.17%
Chile	6.94%	0.98%
Colombia	8.60%	2.64%
Costa Rica	12.21%	6.25%
Ecuador	14.99%	9.03%
El Salvador	16.37%	10.41%
Guatemala	9.43%	3.47%
Honduras	12.21%	6.25%
Mexico	7.63%	1.67%
Nicaragua	13.60%	7.64%
Panama	8.60%	2.64%
Paraguay	9.43%	3.47%
Peru	7.63%	1.67%
Suriname	13.60%	7.64%
Uruguay	8.60%	2.64%
Venezuela	28.10%	22.14%
Central and South America	10.61%	4.65%

Angola	14.99%	9.03%
Benin	12.21%	6.25%
Botswana	7.14%	1.18%
Burkina Faso	13.60%	7.64%
Cameroon	13.60%	7.64%
Cape Verde	13.60%	7.64%
Congo (DR)	14.99%	9.03%
Congo (Rep)	18.46%	12.50%
Côte d'Ivoire	10.96%	5.00%
Egypt	14.99%	9.03%
Ethiopia	12.21%	6.25%
Gabon	16.37%	10.41%
Ghana	14.99%	9.03%
Kenya	13.60%	7.64%
Morocco	9.43%	3.47%
Mozambique	19.83%	13.87%
Namibia	9.43%	3.47%
Nigeria	13.60%	7.64%
Rwanda	13.60%	7.64%
Senegal	10.96%	5.00%
South Africa	9.02%	3.06%
Swaziland	13.60%	7.64%
Tanzania	12.21%	6.25%
Tunisia	13.60%	7.64%
Uganda	13.60%	7.64%
Zambia	16.37%	10.41%
Africa	12.63%	6.67%

Albania	12.21%	6.25%
Armenia	12.21%	6.25%
Azerbaijan	10.13%	4.17%
Belarus	14.99%	9.03%
Bosnia and Herzegovina	14.99%	9.03%
Bulgaria	8.60%	2.64%
Croatia	10.13%	4.17%
Czech Republic	6.94%	0.98%
Estonia	6.94%	0.98%
Georgia	10.13%	4.17%
Hungary	9.02%	3.06%
Kazakhstan	9.02%	3.06%
Kyrgyzstan	13.60%	7.64%
Latvia	7.63%	1.67%
Lithuania	7.63%	1.67%
Macedonia	10.96%	5.00%
Moldova	14.99%	9.03%
Montenegro	12.21%	6.25%
Poland	7.14%	1.18%
Romania	9.02%	3.06%
Russia	9.43%	3.47%
Serbia	10.96%	5.00%
Slovakia	7.14%	1.18%
Slovenia	8.18%	2.22%
Tajikistan	9.43%	3.47%
Ukraine	18.46%	12.50%
Eastern Europe & Russia	9.24%	3.28%

Abu Dhabi	6.65%	0.69%
Bahrain	13.60%	7.64%
Iraq	16.37%	10.41%
Israel	6.94%	0.98%
Jordan	12.21%	6.25%
Kuwait	6.65%	0.69%
Lebanon	14.99%	9.03%
Oman	9.02%	3.06%
Qatar	6.80%	0.84%
Ras Al Khaimah (Emirate of)	7.14%	1.18%
Saudi Arabia	6.94%	0.98%
Sharjah	7.63%	1.67%
United Arab Emirates	6.65%	0.69%
Middle East	7.96%	2.00%

Country	PRS	ERP	CRP	Country	PRS	ERP	CRP
Algeria	65	13.60%	7.64%	Malawi	61	16.37%	10.41%
Brunei	80.5	6.94%	0.98%	Mali	61.3	16.37%	10.41%
Gambia	63.3	14.99%	9.03%	Myanmar	62	16.37%	10.41%
Guinea	54.3	22.61%	16.65%	Niger	54.5	22.61%	16.65%
Guinea-Bissau	62	16.37%	10.41%	Sierra Leone	54.8	22.61%	16.65%
Guyana	66.5	12.21%	6.25%	Somalia	53.5	22.61%	16.65%
Haiti	60	18.46%	12.50%	Sudan	38.8	28.10%	22.14%
Iran	69.3	10.13%	4.17%	Syria	51.8	22.61%	16.65%
Korea, D.P.R.	53	22.61%	16.65%	Togo	61	16.37%	10.41%
Liberia	53.5	22.61%	16.65%	Yemen, Republic	48	28.10%	22.14%
Libya	66.5	12.21%	6.25%	Zimbabwe	59.3	18.46%	12.50%
Madagascar	64	14.99%	9.03%				

Bangladesh	10.96%	5.00%
Cambodia	13.60%	7.64%
China	6.94%	0.98%
Fiji	10.96%	5.00%
Hong Kong	6.65%	0.69%
India	8.60%	2.64%
Indonesia	8.60%	2.64%
Japan	6.94%	0.98%
Korea	6.65%	0.69%
Macao	6.80%	0.84%
Malaysia	7.63%	1.67%
Maldives	13.60%	7.64%
Mauritius	8.18%	2.22%
Mongolia	14.99%	9.03%
Pakistan	14.99%	9.03%
Papua New Guinea	13.60%	7.64%
Philippines	8.60%	2.64%
Singapore	5.96%	0.00%
Solomon Islands	14.99%	9.03%
Sri Lanka	12.21%	6.25%
Taiwan	8.18%	2.22%
Thailand	8.18%	2.22%
Vietnam	10.96%	5.00%
Asia	7.43%	1.47%

Australia	5.96%	0.00%
Cook Islands	12.21%	6.25%
New Zealand	5.96%	0.00%
Australia & New Zealand	5.96%	0.00%

Black #: Total ERP

Red #: Country risk premium

Regional #: GDP weighted average

4. Risk comes from where you operate, not where you are incorporated

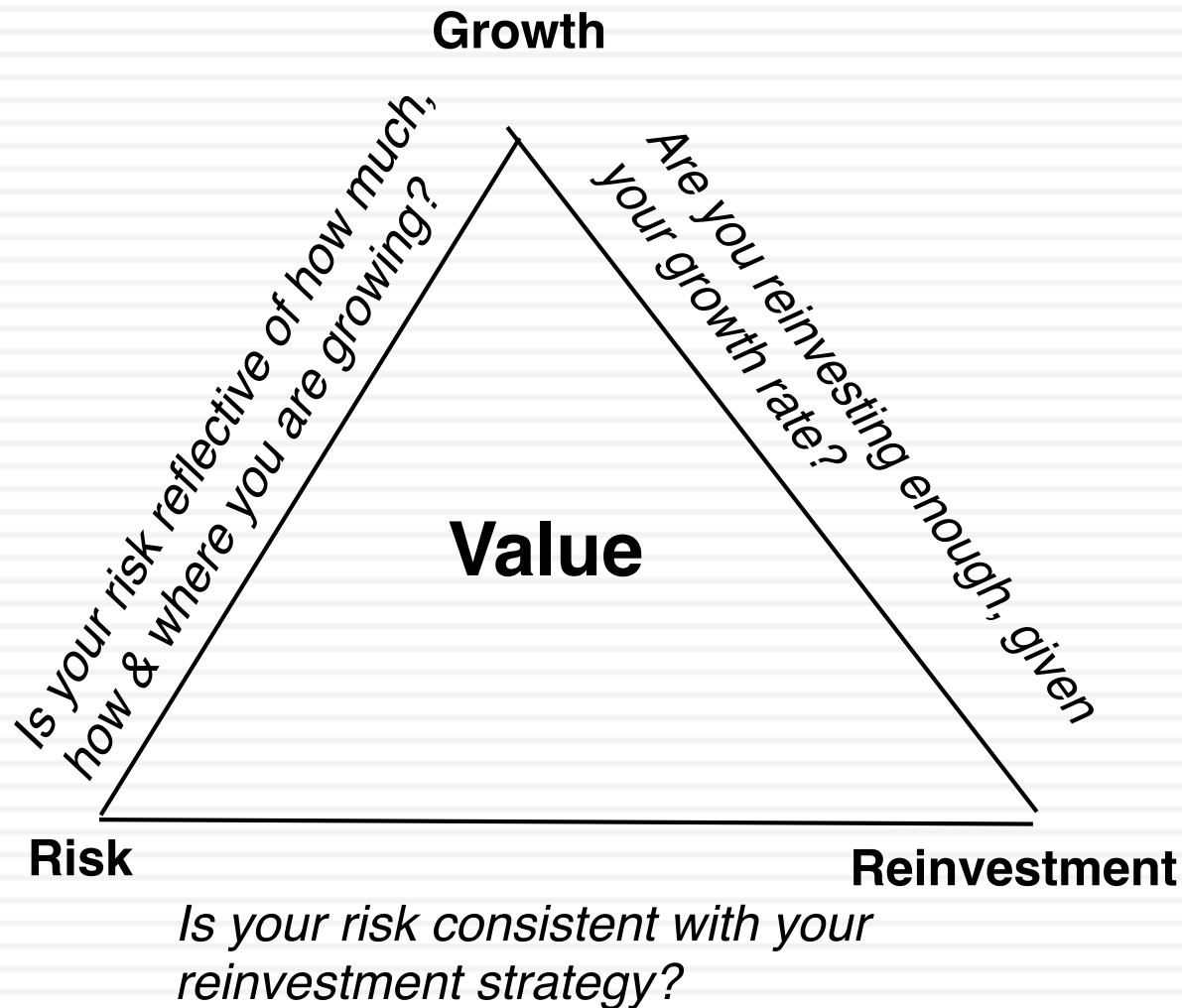
Infosys: ERP in 2017

<i>Region</i>	<i>Revenues</i>	<i>ERP</i>	<i>Weight</i>	<i>Weighted ERP</i>
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?

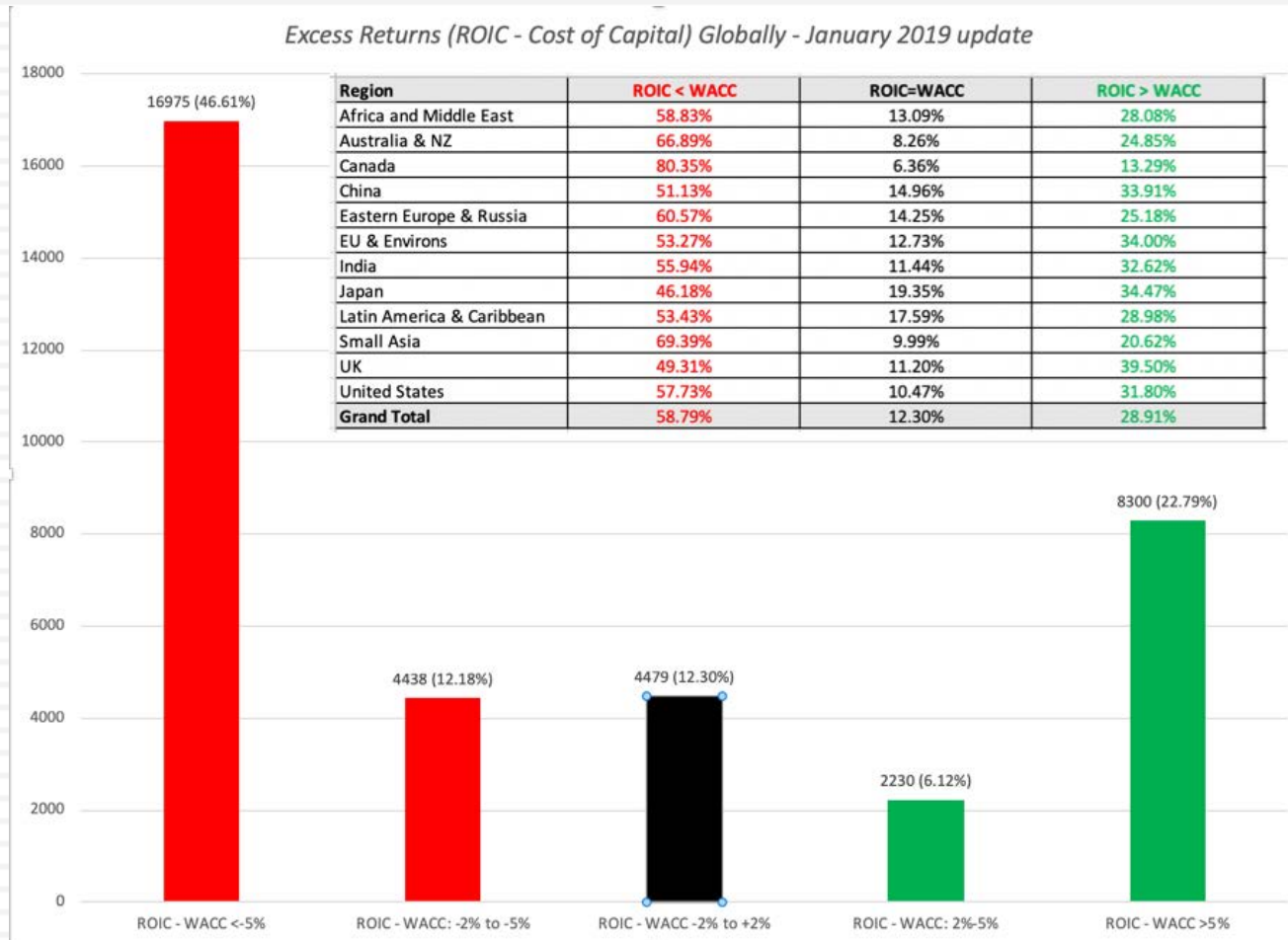
4. Don't let your inputs be at war with each other.

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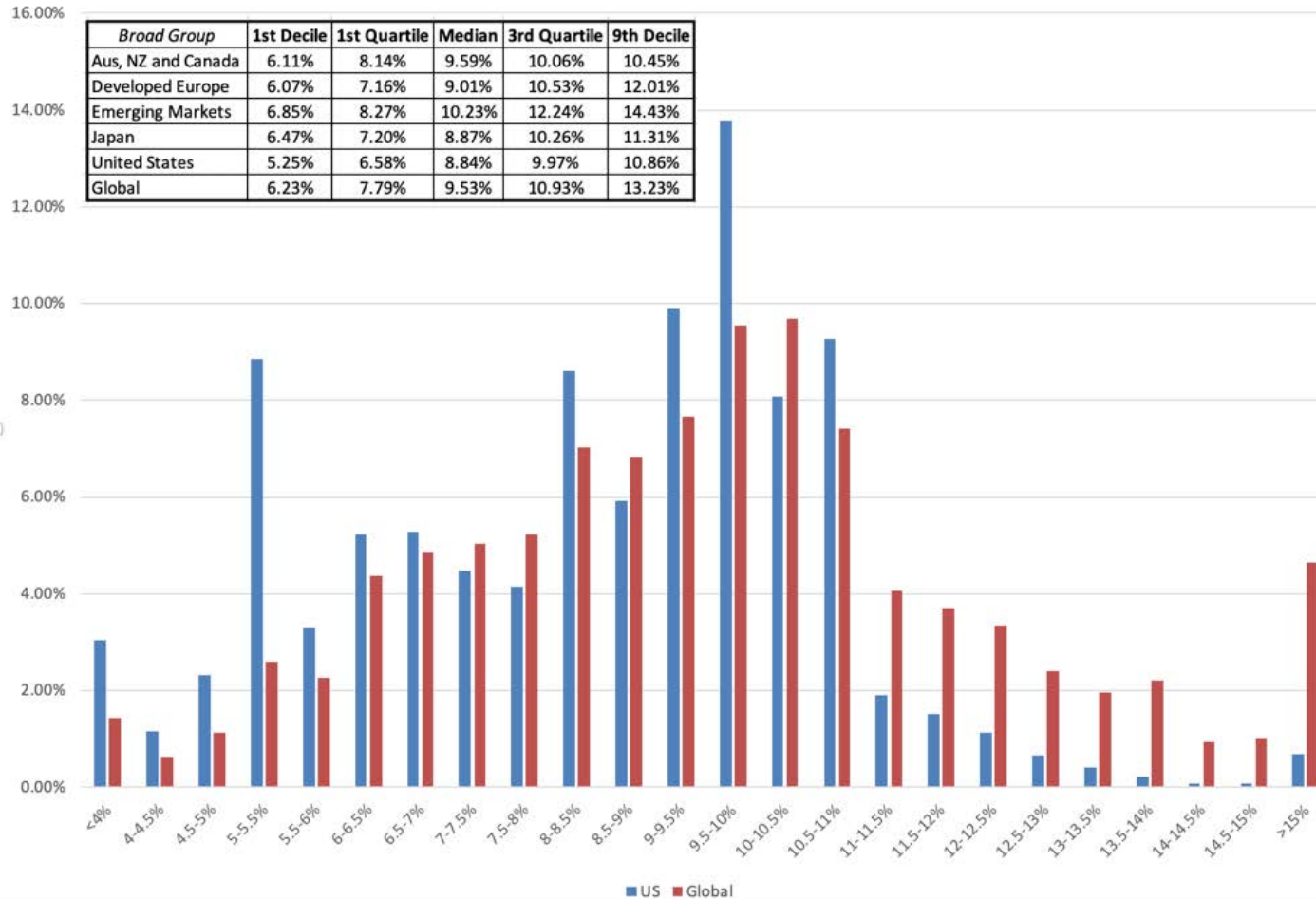
And consider the trade offs..

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5. Don't sweat the small stuff

Cost of Capital Distribution- January 2019



6. Don't let your macro views drown out your micro views..

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- When you are asked to value a company, you should keep your focus on what drives that value. If you bring in your specific macro views into the valuation, the value that you obtain for a company will be a joint result of what you think about the company and your macro views.
- **Bottom line:** If you have macro views, provide them separately. You should be as macro-neutral as you can be, in your company valuations.
- **Follow up:** If you find macro risk dominating your thoughts, deal with it frontally.

ITC: Valuation (July 2019)

	Last year	Last 10 years	Industry
Revenue growth	11.29%	9.99%	7.25%
Pre-tax operating margin	35.43%	33.90%	31.80%
Sales to capital	1.16	1.51	1.52
Return on invested capital	27.57%	34.46%	40.62%

Revenue growth of 10% a year for 5 years, moving down to 4.34% in year 10

Pre-tax operating margin decreases slightly to 33.90% by year 5

Sales to capital ratio of 1.50

Stable Growth
 $g = 4.00\%$
 Cost of capital = 9%
 ROC = 15%;
 Reinvestment Rate = $4\%/15\% = 26.67\%$

Terminal Value₁₀ = $178346 / (.09 - .04) =$

Terminal value	₹ 3,566,924
PV(Terminal value)	₹ 1,392,261
PV (CF over next 10 years)	₹ 820,102
Value of operating assets	₹ 2,212,363
- Debt	₹ 766
+ Cash	₹ 180,386
+ Non-operating assets	₹ 16,458
Value of equity	₹ 2,408,441
- Value of options	₹ 3,655
Value of equity in common stock	2404785.38
Number of shares	₹ 12,231
Estimated value /share	₹ 197
Price	₹ 275
Price as % of value	139.72%

	Base year	1	2	3	4	5	6	7	8	9	10
Revenue growth rate		10.00%	10.00%	10.00%	10.00%	10.00%	8.80%	7.60%	6.40%	5.20%	4.00%
Revenues	₹ 483,527	₹ 531,880	₹ 585,068	₹ 643,574	₹ 707,932	₹ 778,725	₹ 847,253	₹ 911,644	₹ 969,989	₹ 1,020,429	₹ 1,061,246
Operating margin	35.43%	35.12%	34.82%	34.51%	34.21%	33.90%	33.90%	33.90%	33.90%	33.90%	33.90%
Operating income	₹ 171,293	₹ 186,800	₹ 203,694	₹ 222,100	₹ 242,149	₹ 263,988	₹ 287,219	₹ 309,047	₹ 328,826	₹ 345,925	₹ 359,762
Tax rate	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.40%	33.80%	34.20%	34.60%	35.00%
EBIT(1-t)	₹ 114,767	₹ 125,156	₹ 136,475	₹ 148,807	₹ 162,240	₹ 176,872	₹ 191,288	₹ 204,589	₹ 216,368	₹ 226,235	₹ 233,846
- Reinvestment		₹ 32,022	₹ 35,224	₹ 38,746	₹ 42,621	₹ 46,883	₹ 45,383	₹ 42,643	₹ 38,639	₹ 33,404	₹ 27,031
FCFF		₹ 93,134	₹ 101,251	₹ 110,061	₹ 119,619	₹ 129,989	₹ 145,905	₹ 161,946	₹ 177,729	₹ 192,832	₹ 206,814

	Terminal year
Revenue growth rate	4.00%
Revenues	₹ 1,103,696
EBIT (Operating) margin	33.90%
EBIT (Operating income)	₹ 374,152.86
Tax rate	35.00%
EBIT(1-t)	₹ 243,199.36
- Reinvestment	₹ 64,853.16
FCFF	₹ 178,346.20

Cost of capital = $10.24\% (.999) + 2.70\% (.001) = 10.24\%$

Cost of capital moves to 9% from years 6-10

Cost of Equity 10.24%

Cost of Debt
 Bond rating: Aa2
 $(4.34\% + 2.15 + 0.75\%)(1 - .35) = 4.70\%$

Weights
 $E = 99.94\%$ $D = 0.06\%$

In July 2019, the stock was trading at 275 Rs/share.

Riskfree Rate:
 Riskfree rate = 4.34%

Beta 0.73

ERP 8.06%

D/E = 0.06%

Country	Revenues	Weight	ERP
India	₹ 422,597	85.64%	8.17%
Rest of the World	₹ 70,886	14.36%	7.39%
Total	₹ 493,483	100.00%	8.06%

Business	Revenues	EV/Sales	Value	Unlev Beta
Tobacco	₹ 229,133	3.8257	₹ 876,601	0.7735
Household Products	₹ 125,350	1.5196	₹ 190,479	0.6621
Hotel/Gaming	₹ 17,467	2.4811	₹ 43,338	0.7212
Farming/Agriculture	₹ 95,654	1.0534	₹ 100,759	0.5927
Packaging & Container	₹ 58,602	1.2827	₹ 75,169	0.6127
Company	₹ 526,206		₹ 1,286,345	0.7317



The **Chimera DCF** mixes dollar cash flows with peso discount rates, nominal cash flows with real costs of capital and cash flows before debt payments with costs of equity, violating basic consistency rules



In a **Trojan Horse DCF**, Just as the Greeks used a wooden horse to smuggle soldiers into Troy, analysts use the Trojan Horse of cash flows to smuggle in a pricing (in the form of a terminal value, estimated by using a multiple).



In a **Dreamstate DCF**, you build amazing companies on spreadsheets, making outlandish assumptions about growth and operating margins over time.



A **Kabuki DCF** is a work of art, where analyst and rule maker (or court) go through the motions of valuation, with the intent of developing models that are legally or accounting-rule defensible rather than yielding reasonable values.

$$D+CF \neq DCF$$



In a **Robo DCF**, the analyst builds a valuation almost entirely from the most recent financial statements and automated forecasts.

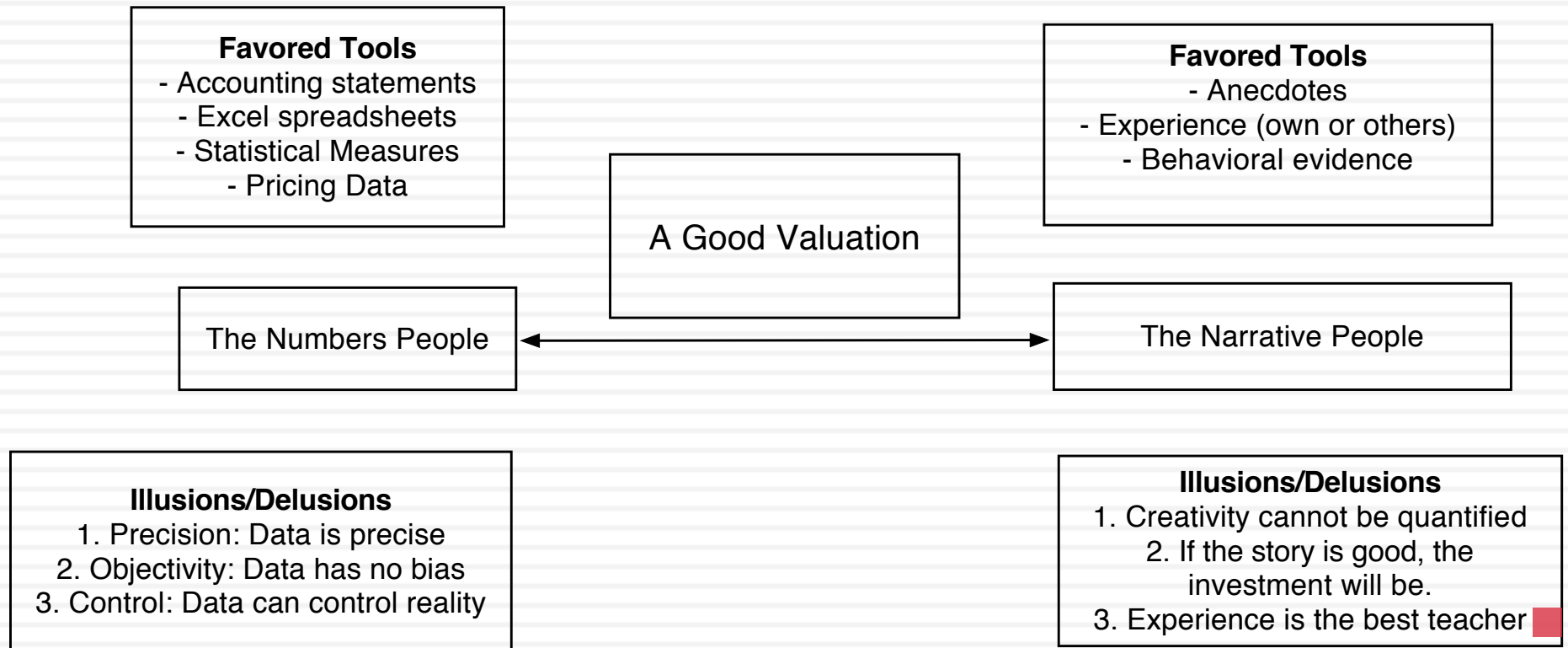


In a **Dissonant DCF**, assumptions about growth, risk and cash flows are not consistent with each other, with little or no explanation given for the mismatch.



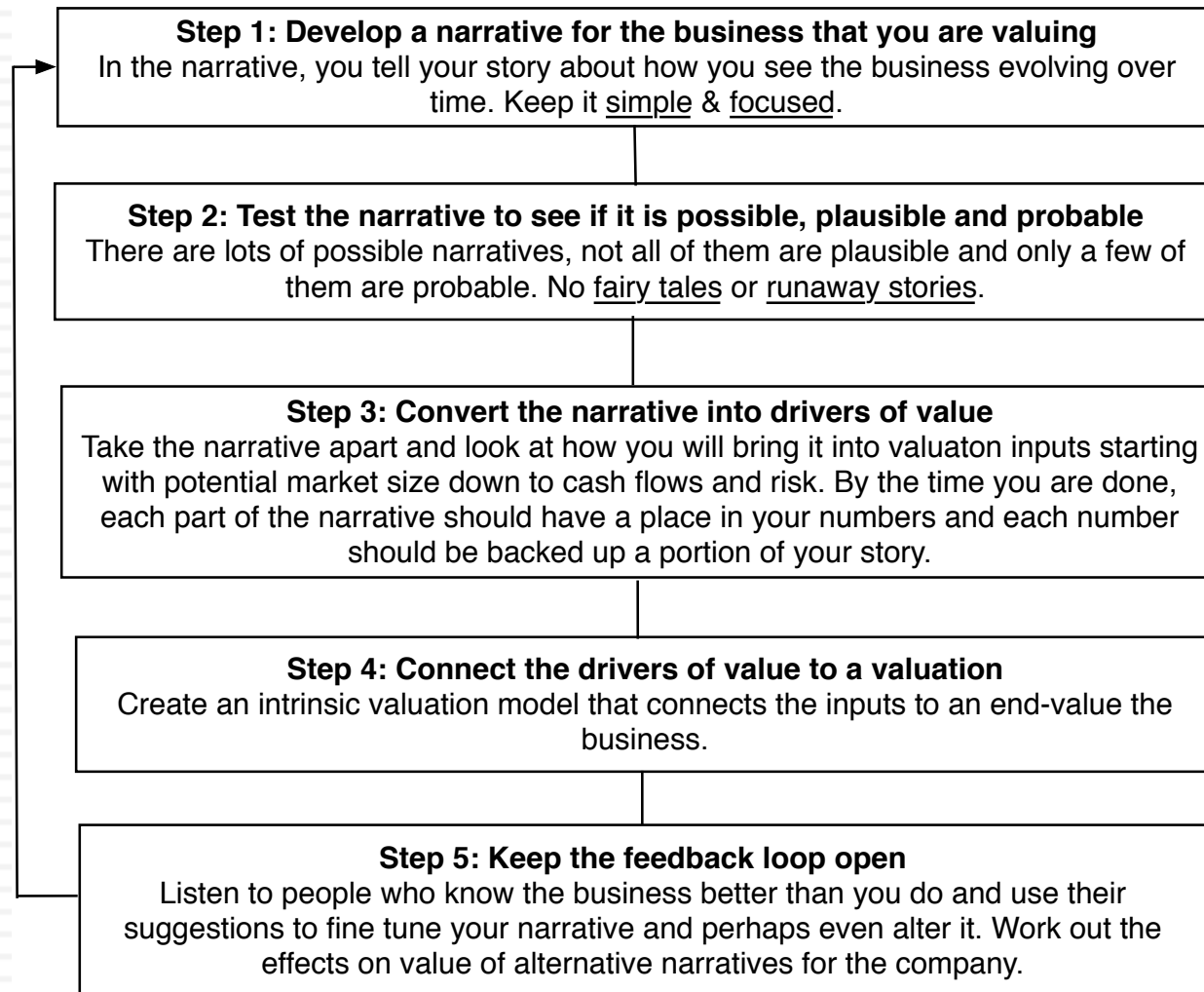
A **Mutant DCF** is a collection of numbers where items have familiar names (free cash flow, cost of capital) but the analyst putting it together has neither a narrative nor a sense of the basic principles of

III. Don't mistake modeling for valuation



From story to numbers and beyond..

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Uber, the Urban Car Service Company

The Story

Uber is an urban car service company, drawing in new users into car service. It will enjoy local networking benefits while preserving its current revenue sharing (80/20) and capital intensity (don't own cars or hire drivers) model.

The Assumptions

	Base year	Years 1-5	Years 6-10	After year 10	Story link
Total Market	100 billion	Grow 6% a year		Grow 2.5%	Urban Car Service + New users
Gross Market Share	1.50%	1.50%>10%		10%	Local Networking benefits
Revenue Share	20.00%	Stays at 20%		20.00%	Preserve revenue share
Operating Margin	3.33%	3.33% - 40%		40.00%	Strong competitive position
Reinvestment	NA	Sales to capital ratio of 5.00		Reinvestment rate = 10%	Low capital intensity model
Cost of capital	NA	12.00%	12%->8%	8%	90th percentile of US firms
Risk of failure	10% chance of failure (with equity worth zero)				Young company

The Cash Flows

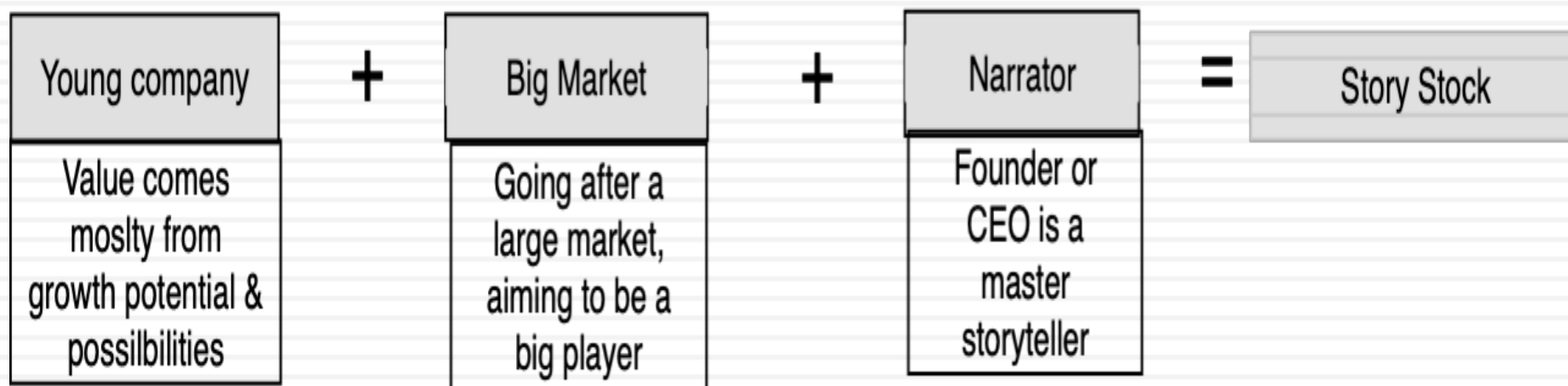
	Total Market	Market Share	Revenues	EBIT (1-t)	Reinvestment	FCFF
1	\$106,000	3.63%	\$769	\$37	\$94	\$(57)
2	\$112,360	5.22%	\$1,173	\$85	\$81	\$4
3	\$119,102	6.41%	\$1,528	\$147	\$71	\$76
4	\$126,248	7.31%	\$1,846	\$219	\$64	\$156
5	\$133,823	7.98%	\$2,137	\$301	\$58	\$243
6	\$141,852	8.49%	\$2,408	\$390	\$54	\$336
7	\$150,363	8.87%	\$2,666	\$487	\$52	\$435
8	\$159,385	9.15%	\$2,916	\$591	\$50	\$541
9	\$168,948	9.36%	\$3,163	\$701	\$49	\$652
10	\$179,085	10.00%	\$3,582	\$860	\$84	\$776
Terminal year	\$183,562	10.00%	\$3,671	\$881	\$88	\$793

The Value

Terminal value	\$14,418		
PV(Terminal value)	\$5,175		
PV (CF over next 10 years)	\$1,375		
Value of operating assets =	\$6,550		
Probability of failure	10%		
Value in case of failure	\$-		
Adjusted Value for operating assets	\$5,895	VCs priced Uber at \$17 billion at the time.	

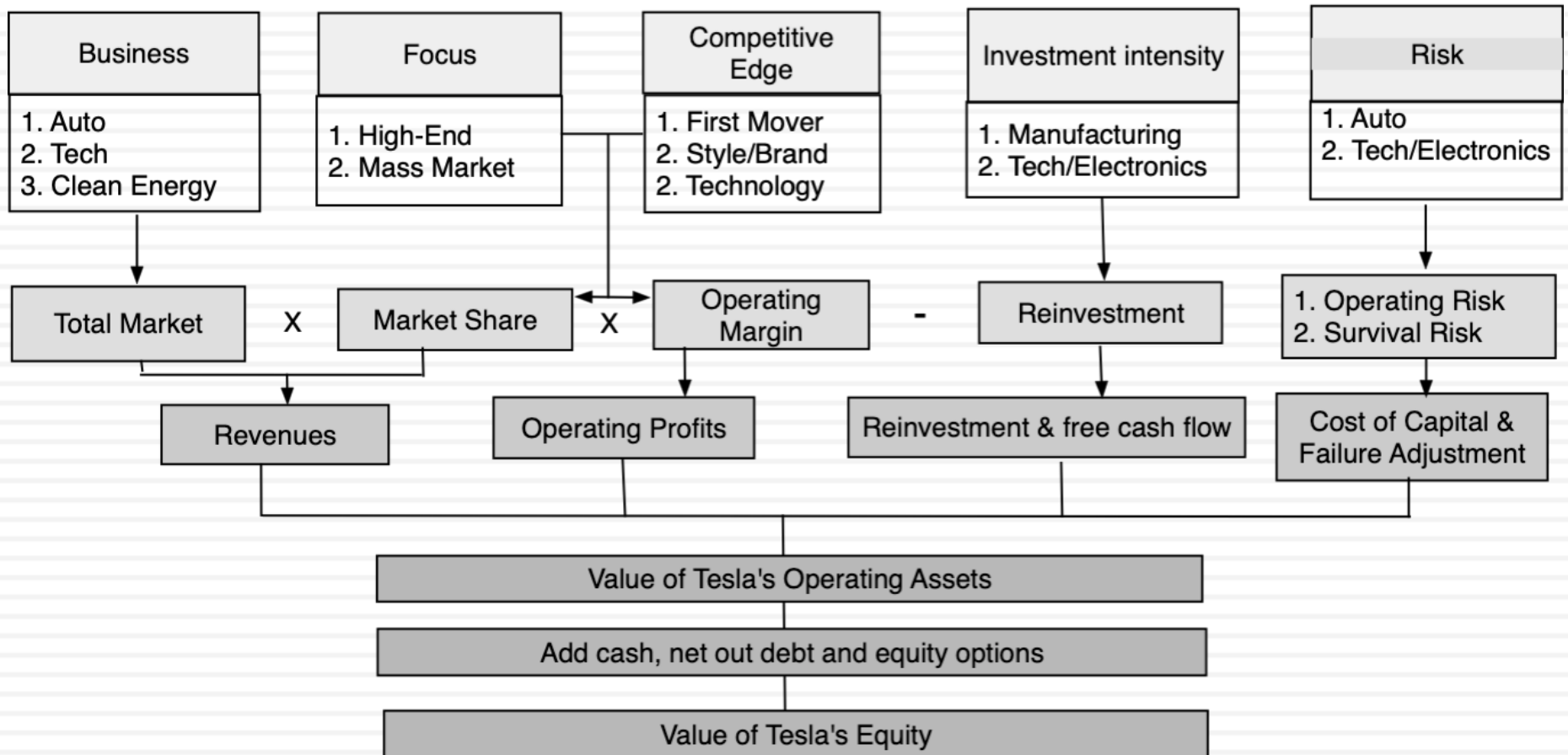
A Story Stock

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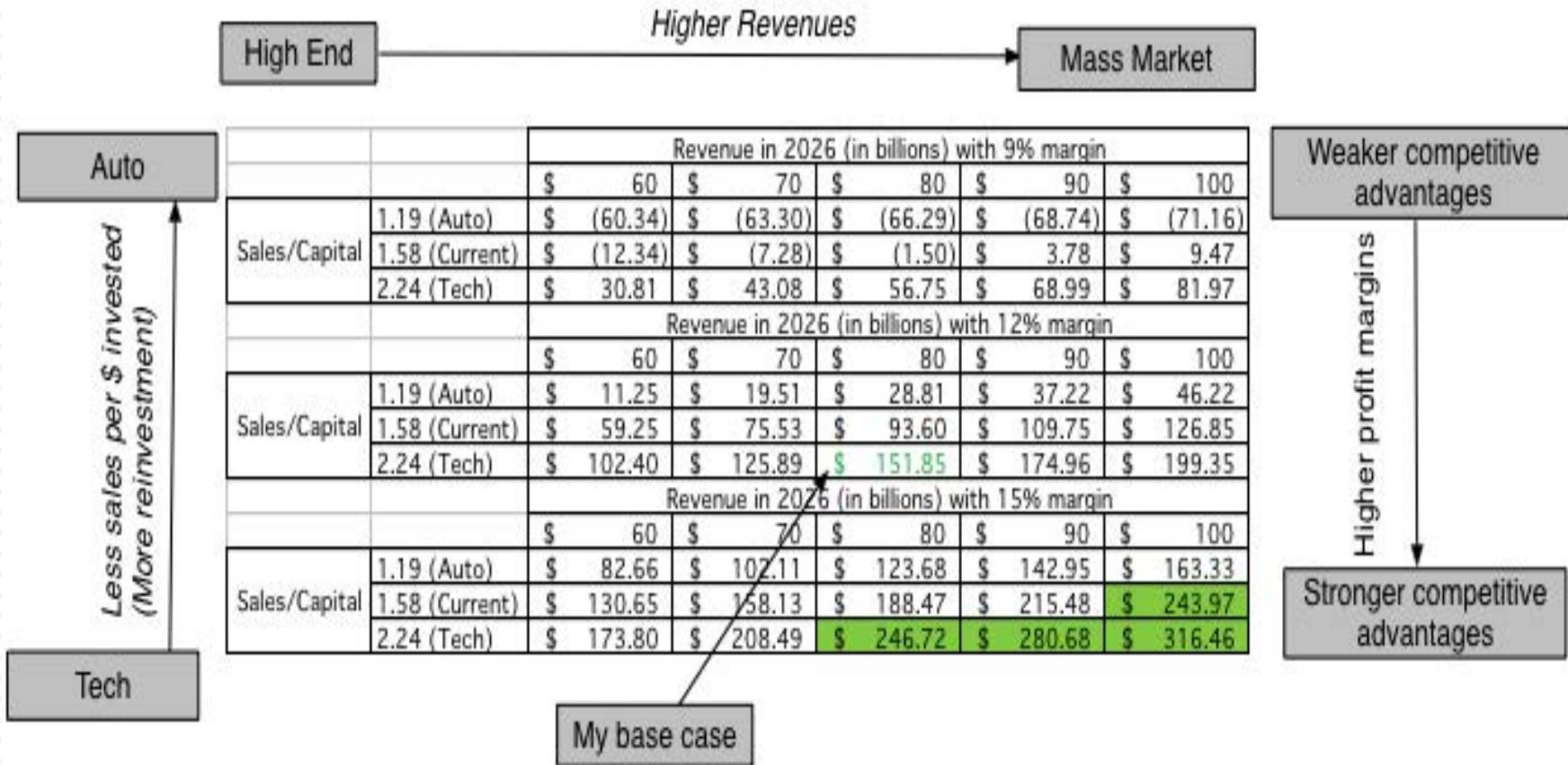


Tesla: What is the story?

The Tesla Story Choices



And the value?



ITC (India)

The Story

ITC is a company rooted in tobacco that is trying to wean its way away from this high-profit, low growth business with investments in multiple businesses starting with consumer products (primarily food) but also including agri businesses, hotels and packaging. While revenue growth is slowing in tobacco, it remains a money machine that is financing ITC's investments in other businesses, most of which are more value destroyers than value creators. Given management's focus on growth, ITC will continue to grow its revenues in its non-tobacco businesses but will see its operating margins and returns on capital decline over time.

The Assumptions

	Base year	Years 1-5	Years 6-10		After year 10	Link to story
Revenues (a)	₹ 483,527.00	10.00% → 4.00%			4.00%	
Operating margin (b)	35.43%	35.43% → 33.90%			33.90%	
Tax rate	33.00%	33.00% → 35.00%			35.00%	
Reinvestment (c)		Sales to capital ratio 1.51		RIR =	26.67%	
Return on capital	27.57%	Marginal ROIC =	49.26%		15.00%	
Cost of capital (d)		10.24% → 9.00%			9.00%	

The Cash Flows

	Revenues	Operating Margin	EBIT	EBIT (1-t)	Reinvestment	FCFF
1	₹ 531,880	35.12%	₹ 186,800	₹ 125,156	₹ 32,022	₹ 93,134
2	₹ 585,068	34.82%	₹ 203,694	₹ 136,475	₹ 35,224	₹ 101,251
3	₹ 643,574	34.51%	₹ 222,100	₹ 148,807	₹ 38,746	₹ 110,061
4	₹ 707,932	34.21%	₹ 242,149	₹ 162,240	₹ 42,621	₹ 119,619
5	₹ 778,725	33.90%	₹ 263,988	₹ 176,872	₹ 46,883	₹ 129,989
6	₹ 847,253	33.90%	₹ 287,219	₹ 191,288	₹ 45,383	₹ 145,905
7	₹ 911,644	33.90%	₹ 309,047	₹ 204,589	₹ 42,643	₹ 161,946
8	₹ 969,989	33.90%	₹ 328,826	₹ 216,368	₹ 38,639	₹ 177,729
9	₹ 1,020,429	33.90%	₹ 345,925	₹ 226,235	₹ 33,404	₹ 192,832
10	₹ 1,061,246	33.90%	₹ 359,762	₹ 233,846	₹ 27,031	₹ 206,814
Terminal year	₹ 1,103,696	33.90%	₹ 374,153	₹ 243,199	₹ 64,853	₹ 178,346

The Value

Terminal value	₹ 3,566,923.91		
PV(Terminal value)	₹ 1,392,260.67		
PV(CF over next 10 years)	₹ 820,102.14		
Value of operating assets =	₹ 2,212,362.82		
Adjustment for distress	₹ -	Probability of failure =	0.00%
- Debt & Mnority Interests	₹ 766.01		
+ Cash & Other Non-operating assets	₹ 196,844.00		
Value of equity	₹ 2,408,440.80		
- Value of equity options	₹ 3,655.42		
Number of shares	12,231.10		
Value per share	₹ 196.61	Stock was trading at =	₹ 274.70

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

25

Better accurate
than precise



High Accuracy
High Precision



Low Accuracy
High Precision

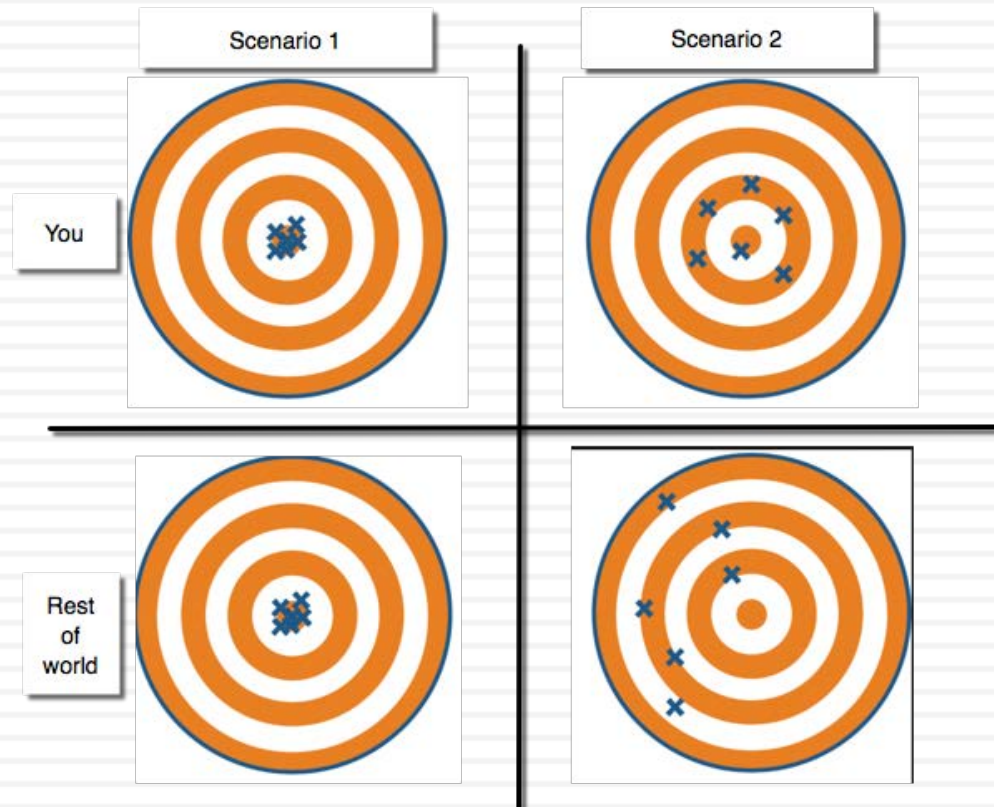


High Accuracy
Low Precision



Low Accuracy
Low Precision

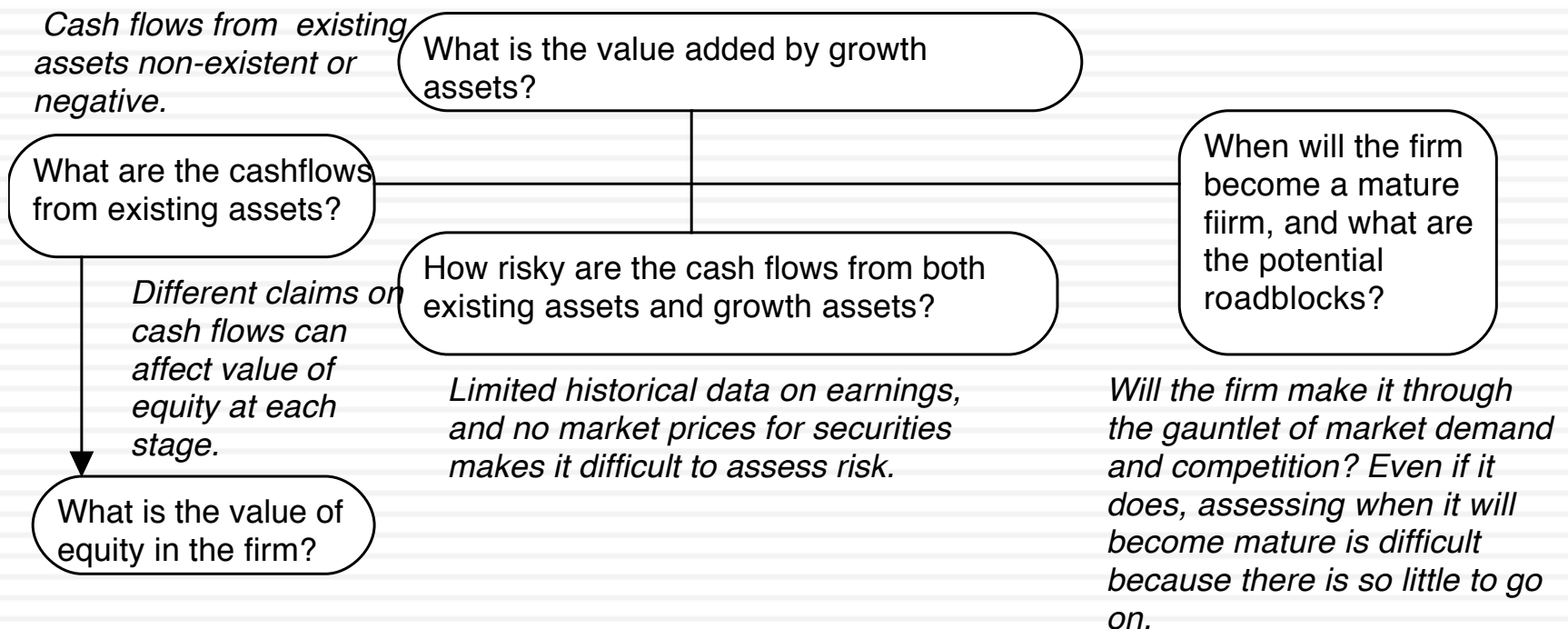
It's all relative



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

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

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.



And the dark side will beckon..

27

- 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: 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

		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

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%

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

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%; Beta = 1.00;
 Cost of capital = 8%
 ROC= 12%;
 Reinvestment Rate=2.5%/12% = 20.83%

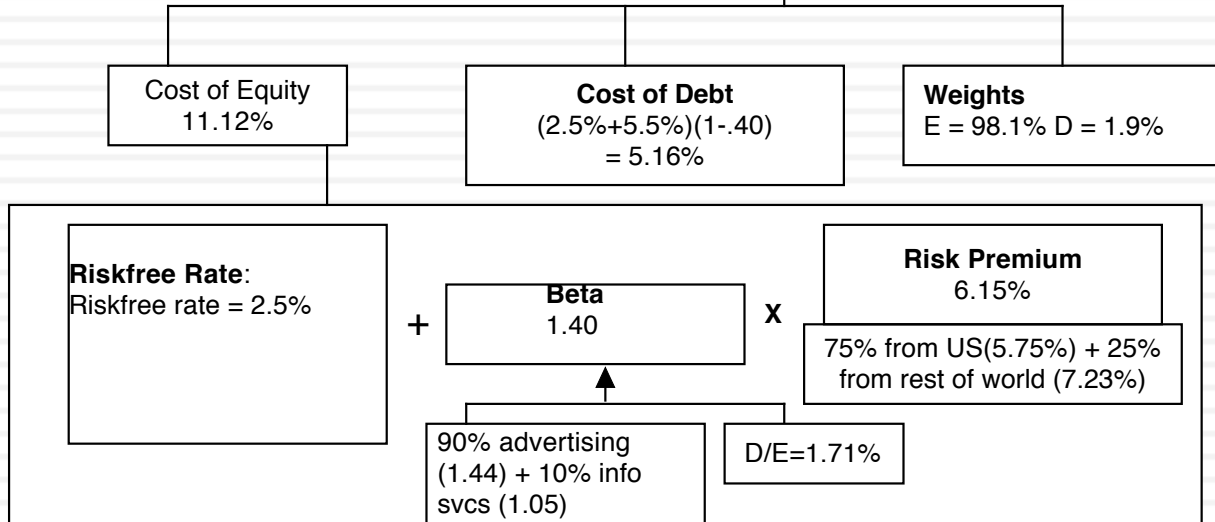
Terminal Value₁₀ = 1466 / (.08 - .025) = \$26,657

		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





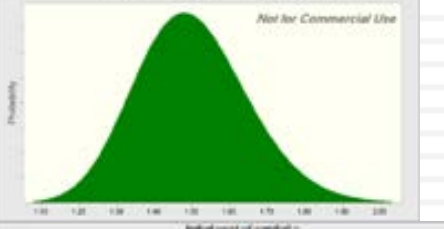

A sobering reminder: You will be “wrong” and it is okay

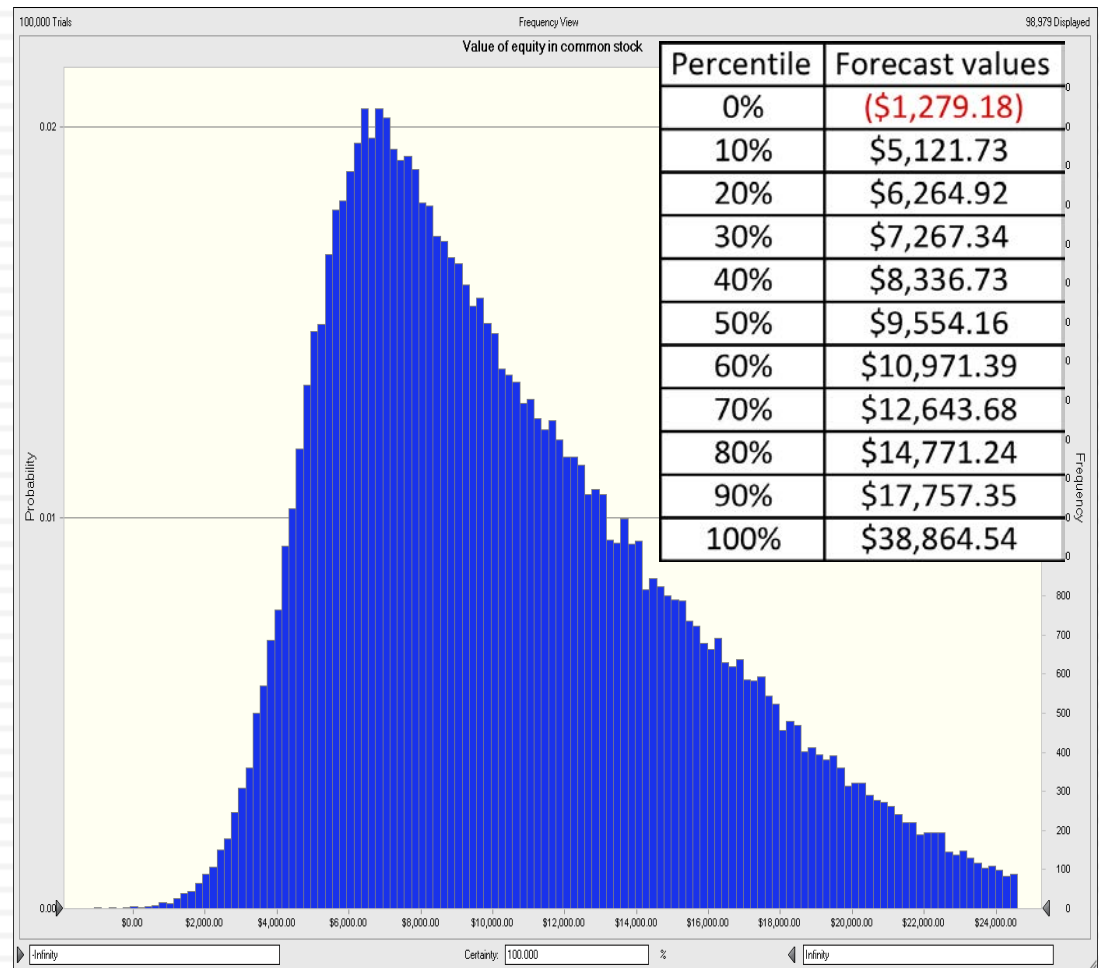
30

- No matter how careful you are in getting your inputs and how well structured your model is, your estimate of value will change both as new information comes out about the company, the business and the economy.
- As information comes out, you will have to adjust and adapt your model to reflect the information. Rather than be defensive about the resulting changes in value, recognize that this is the essence of risk.
- Remember that it is not just your value that is changing, but so is the price, and the price will change a great deal more than the value.

And your value is not a fact, but an estimate..

31

<p>Revenue Growth Rate Distribution: Uniform Expected Value = 55% Minimum Value: 40% Maximum Value: 70%</p>	 <p>Composited annual revenue growth rate over next 5 years - Not for Commercial Use</p>
<p>Target Operating Margin Distribution: Normal Expected Value = 25% Standard Deviation = 5%</p>	 <p>Target pre-tax operating margin (20% of sales in year 10) - Not for Commercial Use</p>
<p>Sales to Capital Ratio Distribution: Lognormal Expected value: 1.50 Standard deviation: 0.15</p>	 <p>Sales to capital ratio (not compounding interest) - Not for Commercial Use</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 - Not for Commercial Use</p>



Amazon

The Greatest (and most Feared) Disruptive Platform in History

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

The Assumptions

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

The Cash Flows

	<i>Revenues</i>	<i>Operating Margin</i>	<i>EBIT</i>	<i>EBIT (1-t)</i>	<i>Reinvestment</i>	<i>FCFF</i>
1	\$ 239,344	8.67%	\$ 20,753	\$ 16,560	\$ 5,249	\$ 11,311
2	\$ 275,245	9.63%	\$ 26,501	\$ 21,147	\$ 6,037	\$ 15,110
3	\$ 316,532	10.59%	\$ 33,506	\$ 26,736	\$ 6,942	\$ 19,794
4	\$ 364,012	11.54%	\$ 42,017	\$ 33,527	\$ 7,983	\$ 25,544
5	\$ 418,614	12.50%	\$ 52,327	\$ 41,754	\$ 9,181	\$ 32,573
6	\$ 471,359	12.50%	\$ 58,920	\$ 46,568	\$ 8,869	\$ 37,699
7	\$ 519,438	12.50%	\$ 64,930	\$ 50,825	\$ 8,084	\$ 42,741
8	\$ 559,954	12.50%	\$ 69,994	\$ 54,258	\$ 6,813	\$ 47,446
9	\$ 590,191	12.50%	\$ 73,774	\$ 56,628	\$ 5,084	\$ 51,544
10	\$ 607,897	12.50%	\$ 75,987	\$ 57,750	\$ 2,977	\$ 54,773
Terminal year	\$ 626,134	12.50%	\$ 78,267	\$ 59,483	\$ 17,845	\$ 41,638

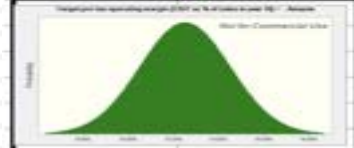
The Value

Terminal value	\$ 925,287		
PV(Terminal value)	\$ 435,438		
PV (CF over next 10 years)	\$ 206,707		
Value of operating assets =	\$ 642,144		
Adjustment for distress	\$ -	Probability of failure =	0.00%
- Debt & Mnority interests	\$ 45,435		
+ Cash & Other Non-operating assets	\$ 27,050		
Value of equity	\$ 623,759		
- Value of equity options	\$ -		
Number of shares	497.00		
Value per share	\$ 1,255.05	Stock was trading at =	\$1,970.19

A Value Distribution for Amazon

Revenue Growth Rate	
Minimum	5.00%
Maximum	25.00%

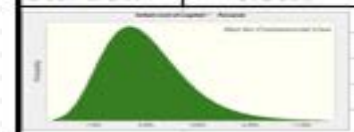
Operating Margin	
Mean	12.50%
Std Dev	2.00%



Sales/Invested Capital	
Minimum	3.95
Likeliest	5.95
Maximum	7.95



Cost of Capital	
Location	5.00%
Mean	7.97%
Std. Dev.	0.80%

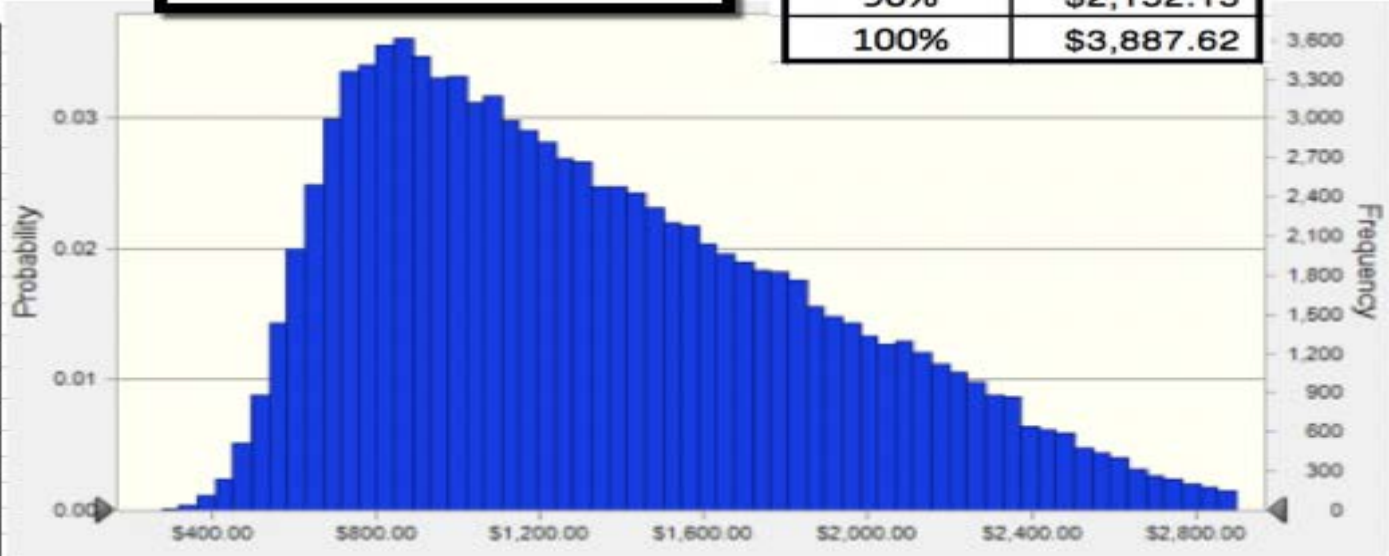


Correlation = 0.40

Base Case	\$1,255.09
Mean	\$1,343.67
Median	\$1,241.98

Amazon: Simulated Values in September 2018

Percentiles	Value/Share
0%	\$234.29
10%	\$705.19
20%	\$832.65
30%	\$957.69
40%	\$1,092.41
50%	\$1,241.97
60%	\$1,411.82
70%	\$1,605.37
80%	\$1,837.98
90%	\$2,152.15
100%	\$3,887.62



Forecasting in the face of uncertainty. A test:

34

- In which of these two cities would you find it easier to forecast the weather?

Weather changeability for Honolulu, Hawaii

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	1.7°	1.2°
Average change in low temperature day-to-day	1.5°	2.0°

Precipitation	Last Month	Last Year
Chance of dry day after a precip day	67%	81%
Chance of precip day after a dry day	7%	13%

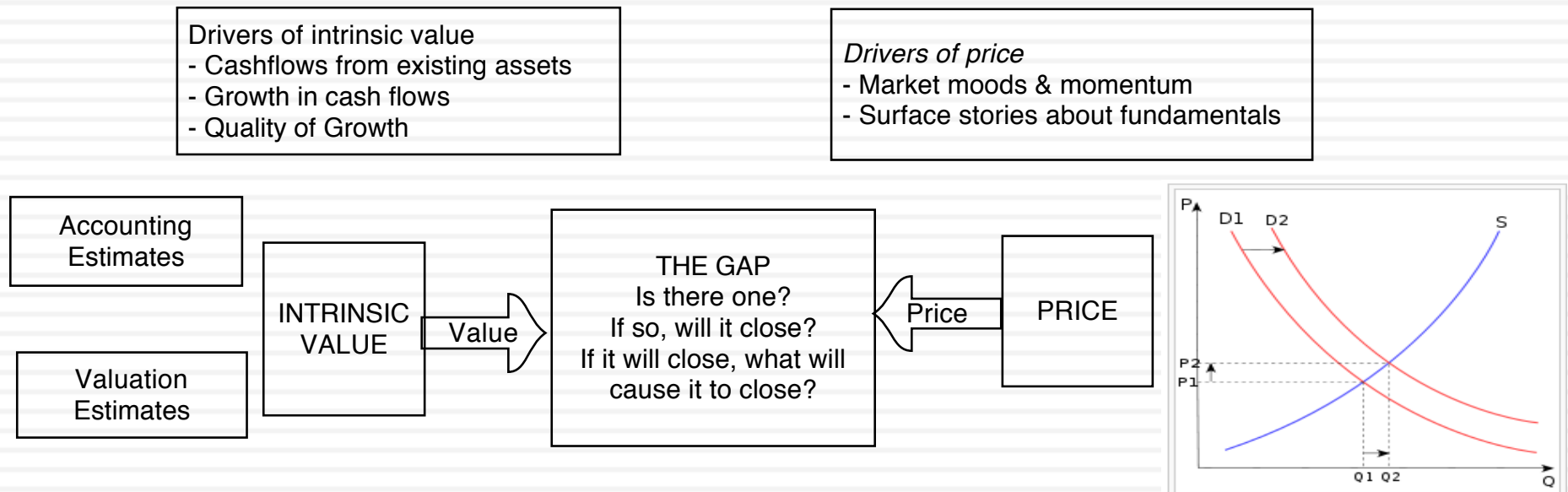
Weather changeability for Epping, North Dakota

Temperature	Last Month	Last Year
Average change in high temperature day-to-day	8.5°	7.7°
Average change in low temperature day-to-day	7.1°	8.6°

Precipitation	Last Month	Last Year
Chance of dry day after a precip day	50%	65%
Chance of precip day after a dry day	38%	20%


V. Don't mistake price for value!

35



Are you pricing or valuing?

36

 **5369 La Jolla Mesa Dr**
La Jolla, CA 92037
Status: Active





\$995,000
Price

3
Beds

2.5
Baths


1,440 Sq. Ft.
\$691 / Sq. Ft.


Built: 1955 Lot Size: 3,000 Sq. Ft. On Redfin: 12 days

Favorite X-Out Share... Tour Home

Overview Property Details Tour Insights Property History Public Records Activity Schools Neighborhood & Offer Insights Similar Homes




1 of 25  [Play Video](#)

Lisa Padilla
REDFIN Real Estate Agent

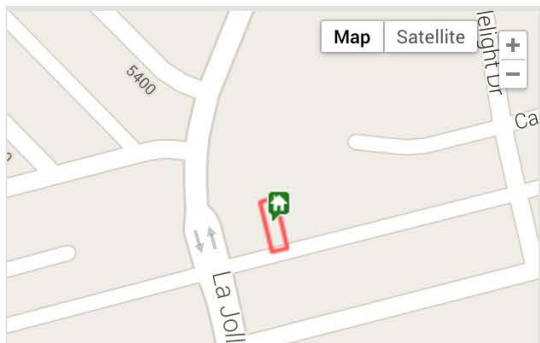
★★★★★
47 client reviews

\$8,726 commission refund

 [Go Tour This Home](#)

[Ask Lisa a Question](#) or [Start an Offer](#)

1 of 4 Redfin Agents in this area



Classifying Assets: 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.

The determinants of price

38

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".

Pricing Twitter: Start with the “comparables”

39

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

40

	<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”

41

- 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

VII. Investing is an act of faith..

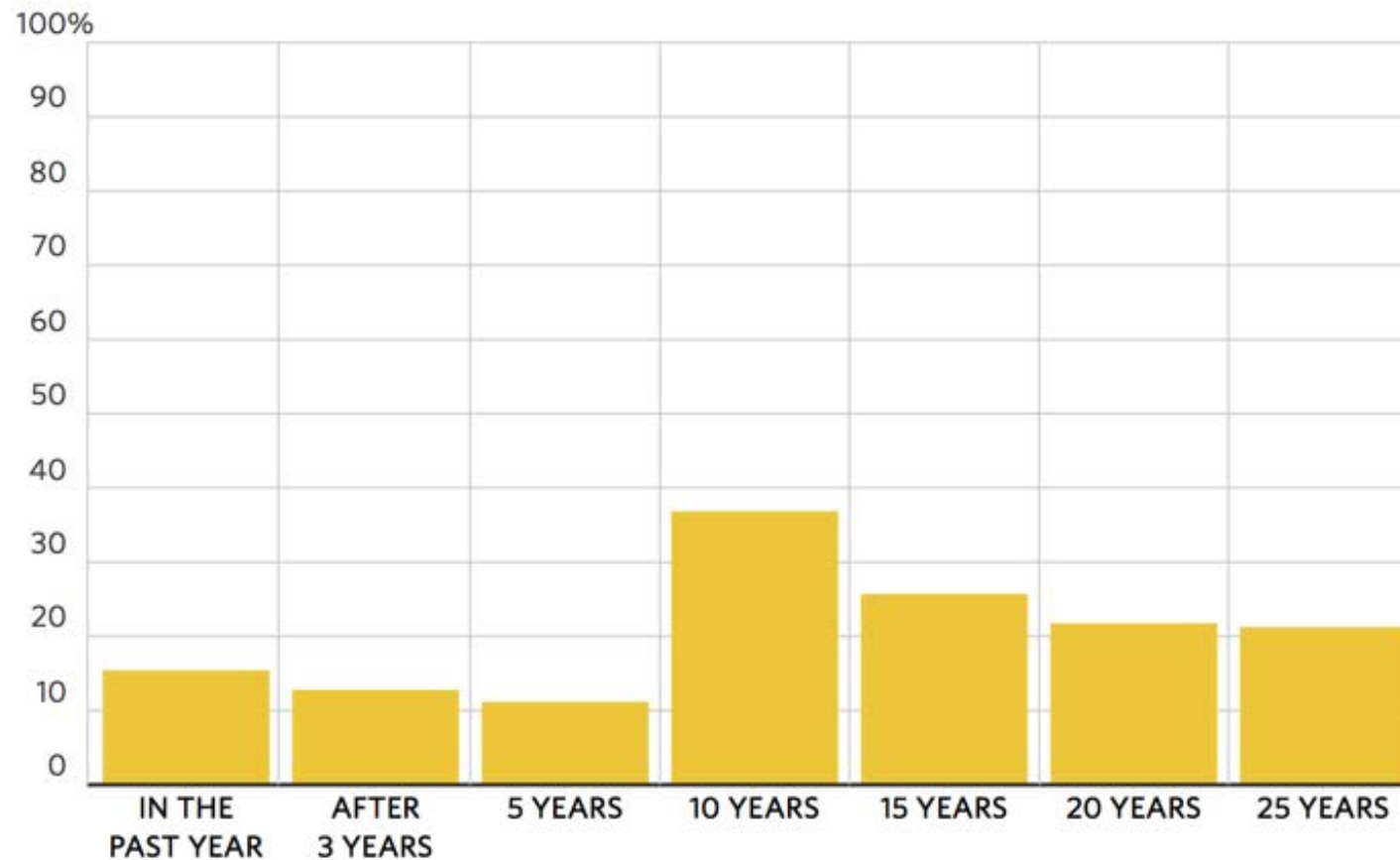
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- When investing, we are often told that if you are virtuous (careful in your research, good at valuation, have a long time horizon), you will be rewarded (with high returns).
- That pitch is amplified by anecdotal evidence of righteous ones, i.e., 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

Tough to Beat

Percentage of U.S. large-company mutual funds outperforming the Vanguard 500 Index Fund



And it stays that way across styles..

	<i>% of US Mutual Funds that beat their respective indices</i>			
	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%.

And the "smart" money does not stay smart for very long

Funds' Flop

Three-year rolling relative performance of stock hedge funds



*Compared to a 50/50 MSCI World Net Return Local Currency/LIBOR 3 Month USD index

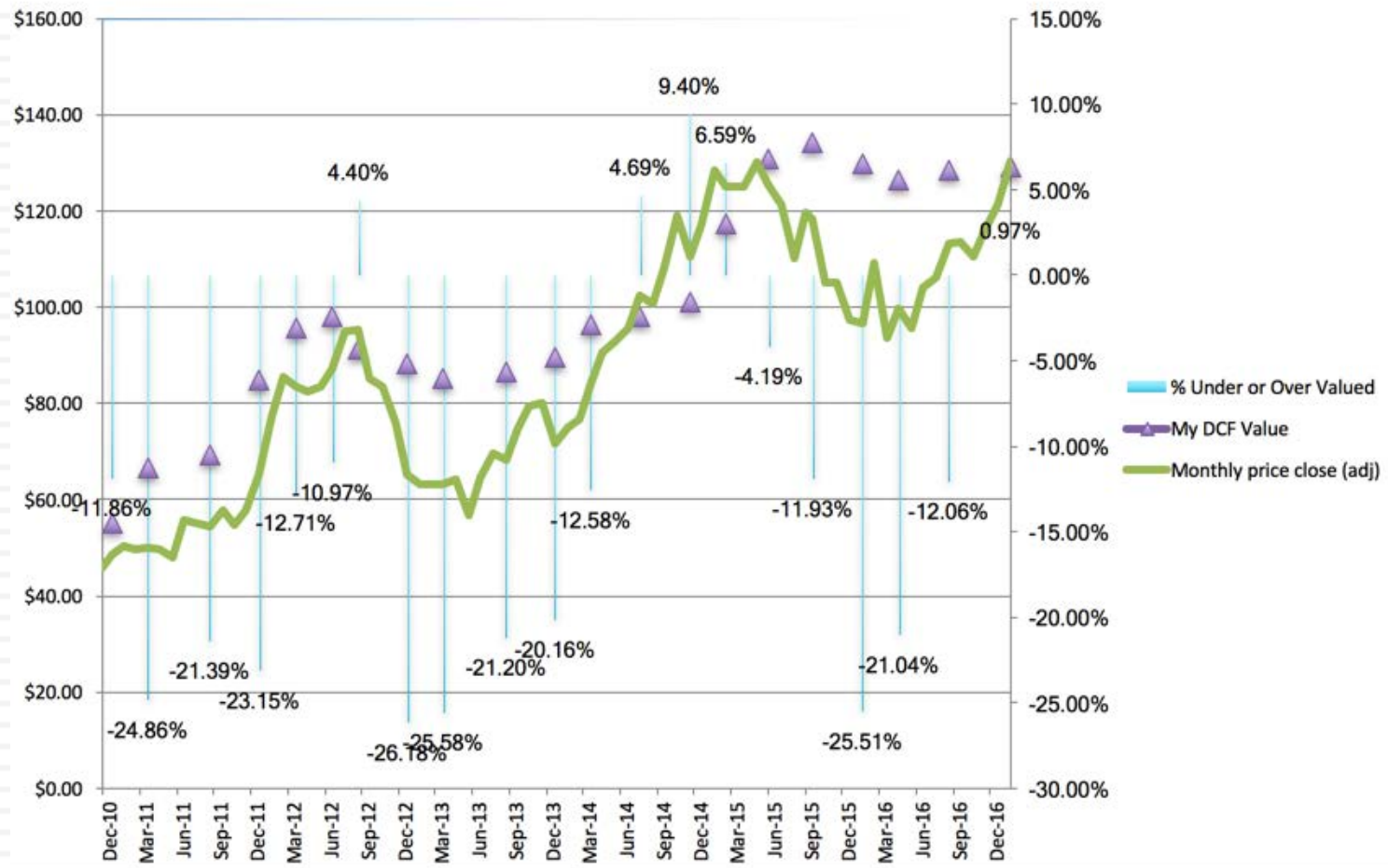
Source: Partners Capital Investment Group analysis
of data from HFR, MSCI and WSJ Market Data Group

THE WALL STREET JOURNAL.

Investment Heaven is a promise, not a guarantee..

46

Apple, Price and Value - 2010 to 2017



Follow the yellow brick road..

