MY VALUATION JOURNEY: HAVE FAITH, YOU MUST!

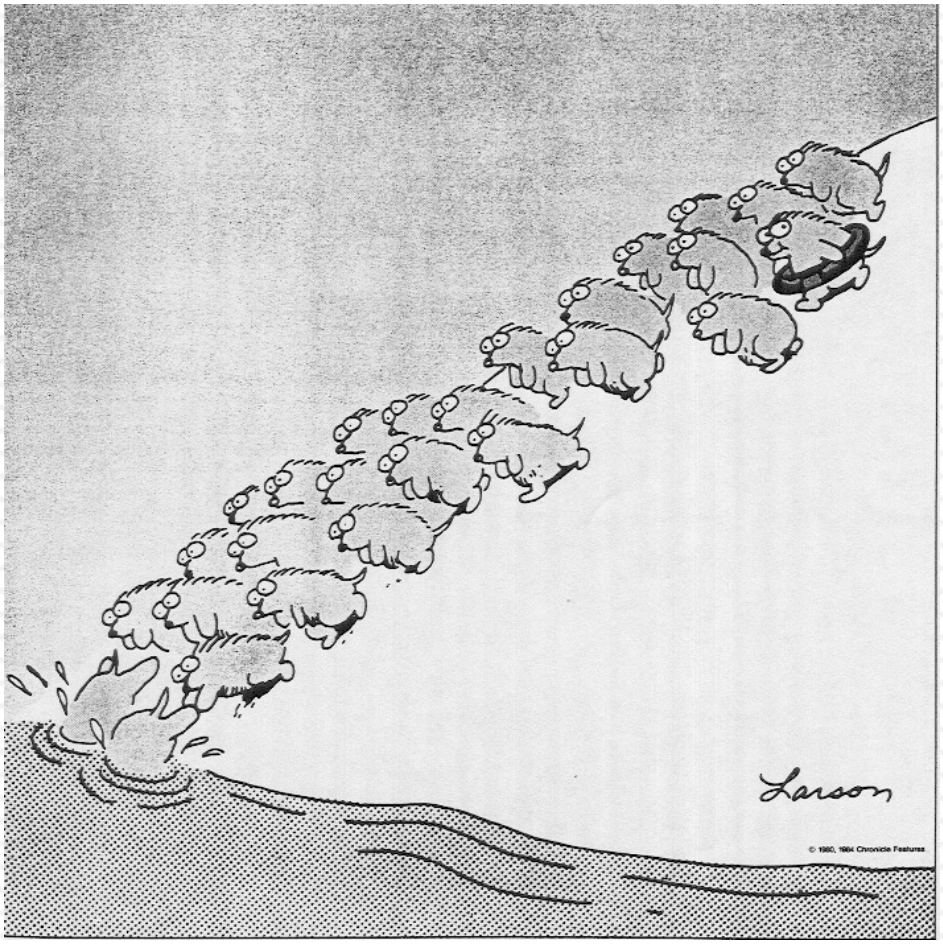
June 2020

Aswath Damodaran

Some Initial Thoughts

" One hundred thousand lemmings cannot be wrong"

Graffiti



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The Themes

Theme 1: Characterizing Valuation as a discipline

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

Theme 2: Valuing an asset is not the same as pricing that asset

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

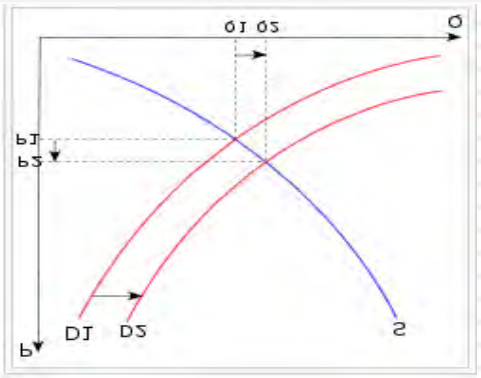
INTRINSIC VALUE

Value

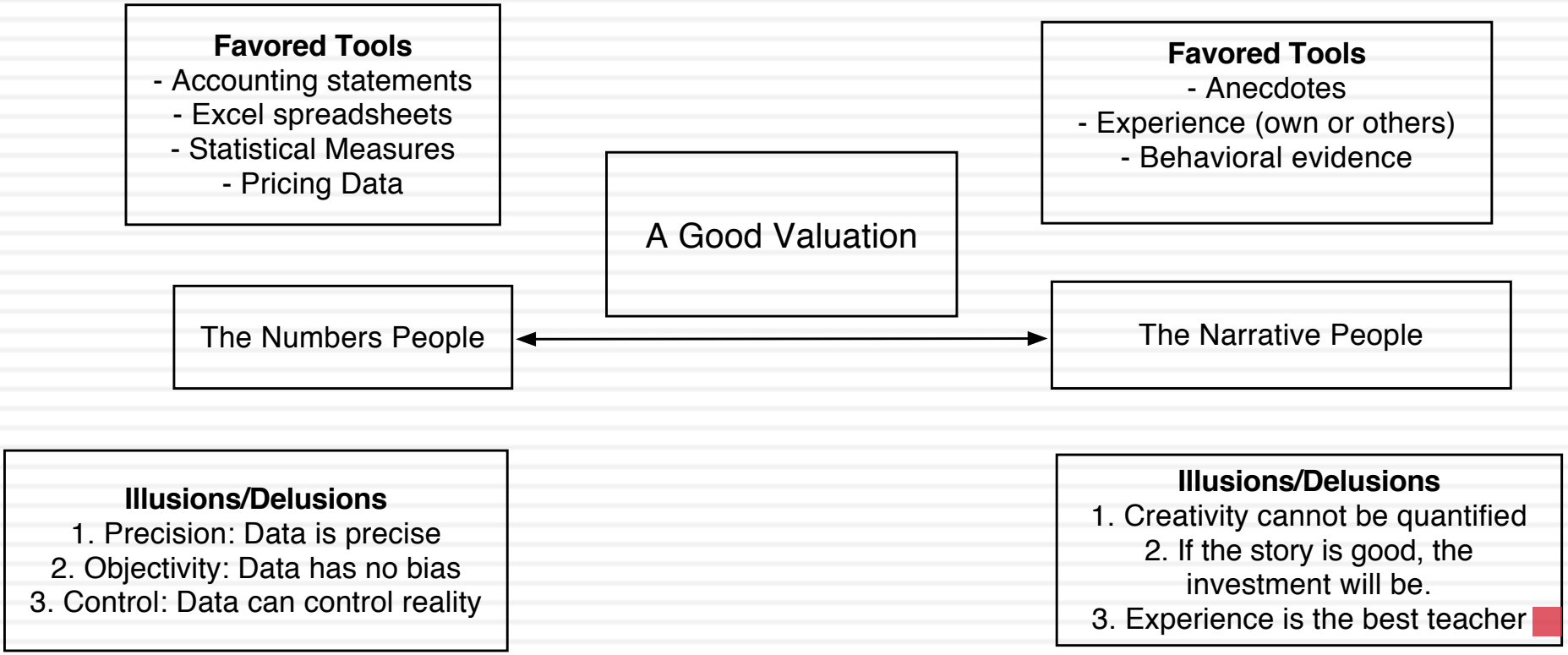
THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Price

PRICE



Theme 3: Good valuation = Story + Numbers



Theme 4: If you value something, you should be willing to act on it..

- There is very little theory in valuation and I am not sure what an academic valuation would like like and am not sure that I want to find out.
- Pragmatism, not purity: The end game is to estimate a value for an asset. I plan to get there, even if it means taking short cuts and making assumptions that would make purists blanch.
- To act on your valuations, you have to have faith in
  - In your own valuation judgments.
  - In markets: that prices will move towards your value estimates.

  That faith will have to be earned.

Misconceptions about Valuation

- Myth 1: A valuation is an objective search for "true" value
  - Truth 1.1: All valuations are biased. The only questions are how much and in which direction.
  - Truth 1.2: The direction and magnitude of the bias in your valuation is directly proportional to who pays you and how much you are paid.
- Myth 2.: A good valuation provides a precise estimate of value
  - Truth 2.1: There are no precise valuations
  - Truth 2.2: The payoff to valuation is greatest when valuation is least precise.
- Myth 3: . The more quantitative a model, the better the valuation
  - Truth 3.1: One's understanding of a valuation model is inversely proportional to the number of inputs required for the model.
  - Truth 3.2: Simpler valuation models do much better than complex ones.

Approaches to Valuation

- **Intrinsic valuation**, relates the value of an asset to the present value of expected future cashflows on that asset. In its most common form, this takes the form of a discounted cash flow valuation.
- **Relative valuation**, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash flows, book value or sales.
- **Contingent claim valuation**, uses option pricing models to measure the value of assets that share option characteristics.

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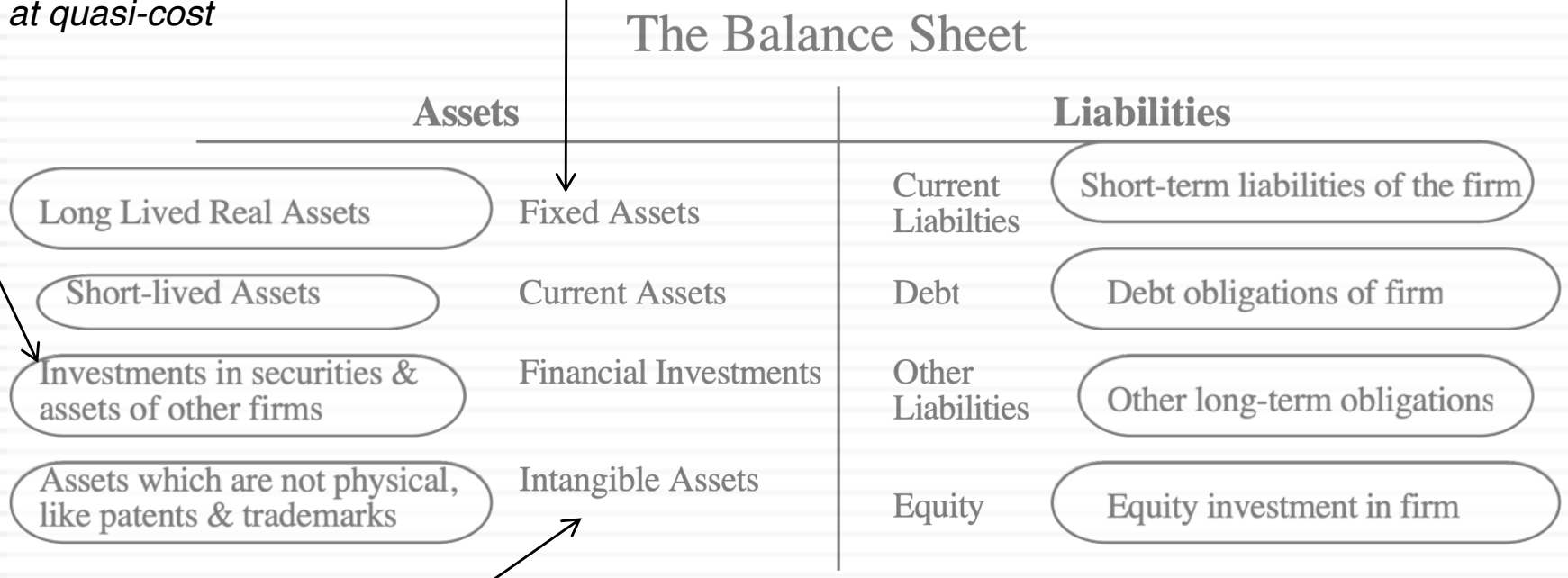
I. Accounting is not finance

An Accounting Balance Sheet

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

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.

The COVID effect

- The COVID crisis will wreak havoc on financial statements, as losses and write offs work their way through company financials.
- On income statements, expect to see the following:
  - An attempt to move losses/bad decisions into the virus column, even if it representing pre-existing problems.
  - The treatment of crisis-related expenses as non-operating and reporting of earnings before COVID and after.
- On balance sheets, big write offs will make the book value of equity, already a questionable number, even more questionable.
- The gap between accounting and financial balance sheets will get wider.

II. D + CF ≠ DCF

Just because you have cash flows and discount rates does not mean that you have a DCF

The Essence of 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:

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

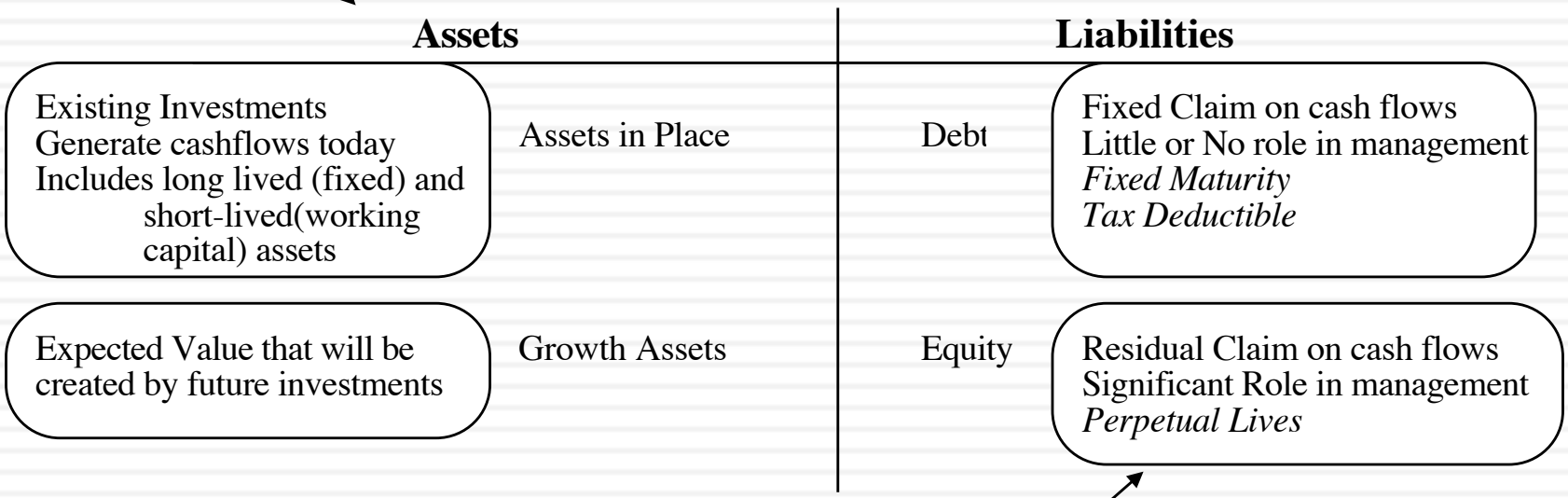
1. *The IT Proposition*: If "it" does not affect the cash flows or alter risk (thus changing discount rates), "it" cannot affect value.
2. *The DUH Proposition*: For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.
3. *The DON'T FREAK OUT Proposition*: 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.

Discounted Cash Flow Valuation

- *What is it*: In discounted cash flow valuation, the value of an asset is the present value of the expected cash flows on the asset.
- *Philosophical Basis*: Every asset has an intrinsic value that can be estimated, based upon its characteristics in terms of cash flows, growth and risk.
- *Information Needed*: To use discounted cash flow valuation, you need
  - to estimate the life of the asset
  - to estimate the cash flows during the life of the asset
  - to estimate the discount rate to apply to these cash flows to get present value
- *Market Inefficiency*: Markets are assumed to make mistakes in pricing assets across time, and are assumed to correct themselves over time, as new information comes out about assets.

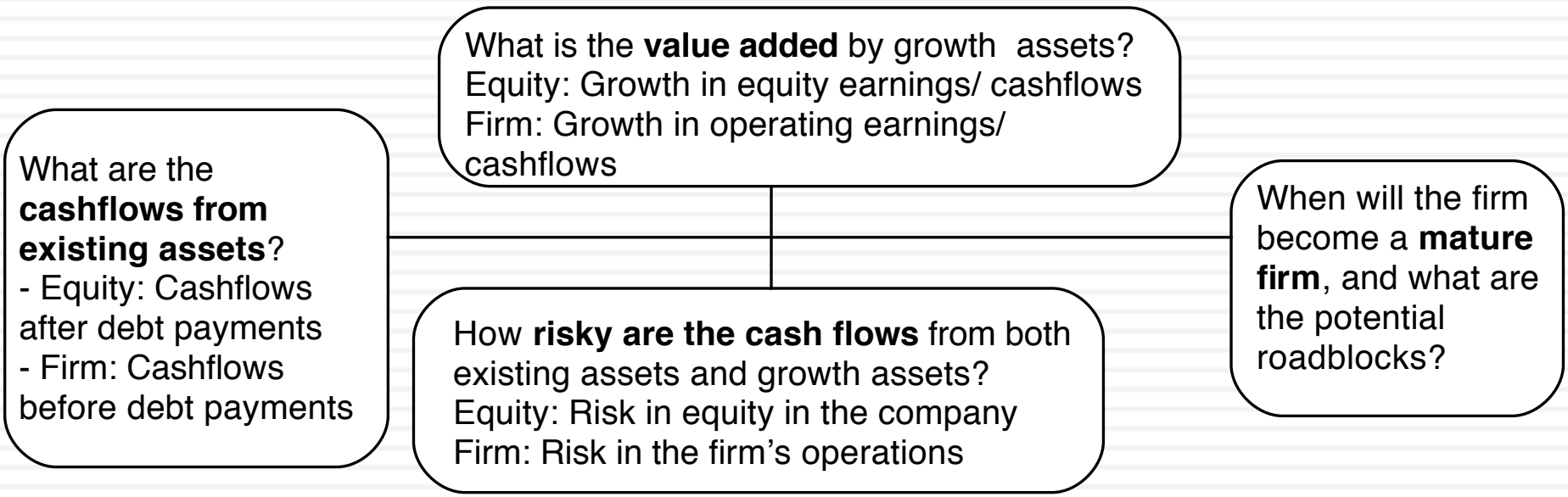
DCF Choices: Equity Valuation versus Firm Valuation

Firm Valuation: Value the entire business



Equity valuation: Value just the equity claim in the business

The big value questions…



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

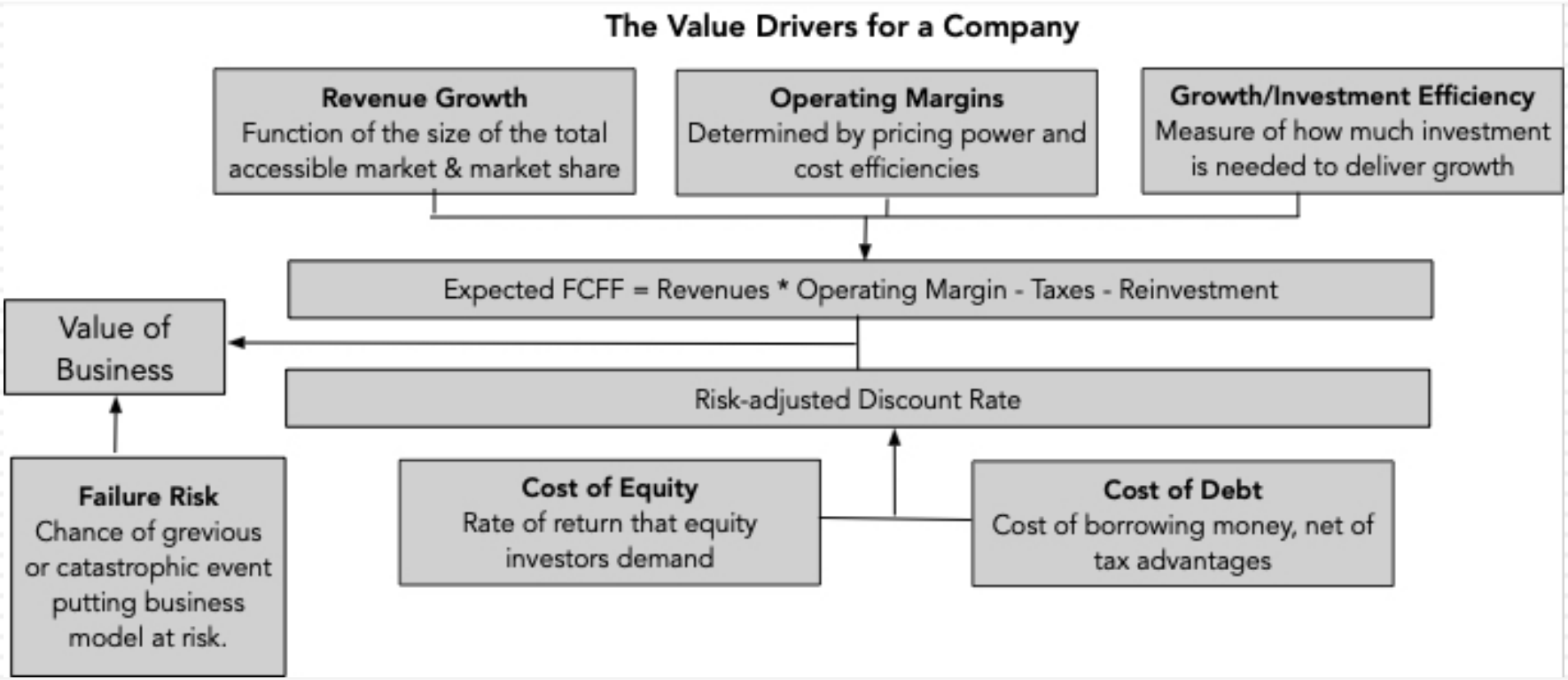
Cash flows from existing assets
The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

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

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.

The Drivers of Value



A. Cash Flows

To get to cash flow	Here is why
Operating Earnings	This is the earnings before interest & taxes you generate from your existing assets. Operating Earnings = Revenues * Operating Margin Measures the operating efficiency of your assets & can be grown either by growing revenues and/or improving margins.
(minus) Taxes	These are the taxes you would pay on your operating income and are a function of the tax code under which you operate & your fidelity to that code.
(minus) Reinvestment	Reinvestment is designed to generate future growth and can be in long term and short term assets. Higher growth usually requires more reinvestment, and the efficiency of growth is a function of how much growth you can get for your reinvestment.
Free Cash Flow to the Firm	This is a pre-debt cash flow that will be shared by lenders (as interest & principal payments) and by equity investors (as dividends & buybacks).

Shell: From Revenues to Cash flows

	2011	2012	2013	2014	2015
Revenues	**$470,171**	**$467,153**	**$451,235**	**$421,105**	**$264,960**
Operating Margin	9.31%	8.11%	6.15%	5.47%	-0.88%
Operating Income	**$43,764**	**$37,879**	**$27,769**	**$23,026**	**$(2,322)**
Effective tax rate	42.07%	44.02%	46.63%	50.80%	47.98%
Operating Income after taxes	**$25,352**	**$21,205**	**$14,821**	**$11,328**	**$(1,208)**
Depreciation	$11,713	$13,518	$16,099	$17,196	$16,779
Cap Ex	$26,301	$32,576	$39,975	$31,676	$26,131
Change in WC	$6,471	$(3,391)	$(2,988)	$(6,405)	$(5,521)
FCFF	**$4,293**	**$5,538**	**$(6,067)**	**$3,253**	**$(5,039)**
Reinvestment	$21,059	$15,667	$20,888	$8,075	$3,831

Infosys: From Revenues to Cash flows

Year	2013	2014	2015	2016	2017	LTM
Revenues	₹ 401,674	₹ 494,280	₹ 544,568	₹ 629,679	₹ 661,427	₹ 683,119
Operating Income	₹ 104,301	₹ 120,439	₹ 143,972	₹ 159,193	₹ 163,283	₹ 165,945
Effective Tax Rate	26.3%	27.6%	28.6%	28.0%	28.0%	21.0%
After-tax Operating Income	**₹ 76,823**	**₹ 87,180**	**₹ 102,845**	**₹ 114,579**	**₹ 117,494**	**₹ 131,155**
- (Cap Ex - Depreciation)	₹ 21,229	₹ 13,542	₹ 25,006	₹ 20,810	₹ 11,080	₹ 2,936
- Change in non-cash WC	₹ 10,859	₹ 1,498	₹ 11,503	₹ 22,799	₹ 18,791	₹ 766
FCFF	**₹ 44,734**	**₹ 72,140**	**₹ 66,336**	**₹ 70,970**	**₹ 87,623**	**₹ 127,453**
Reinvestment Rate	41.77%	17.25%	35.50%	38.06%	25.42%	2.82%

Includes acquisitions

B. Discount rates

Expected Return on a Risky Investment = Cost of Equity

=

Risk free Rate
Rate of return on a long term, default free bond.

Will vary across currencies and across time.

+

Beta
Relative measure of risk added to a diversified portfolio.

Determined by the business or businesses that you operate in, with more exposure to macro economic risk translating into a higher beta.

X

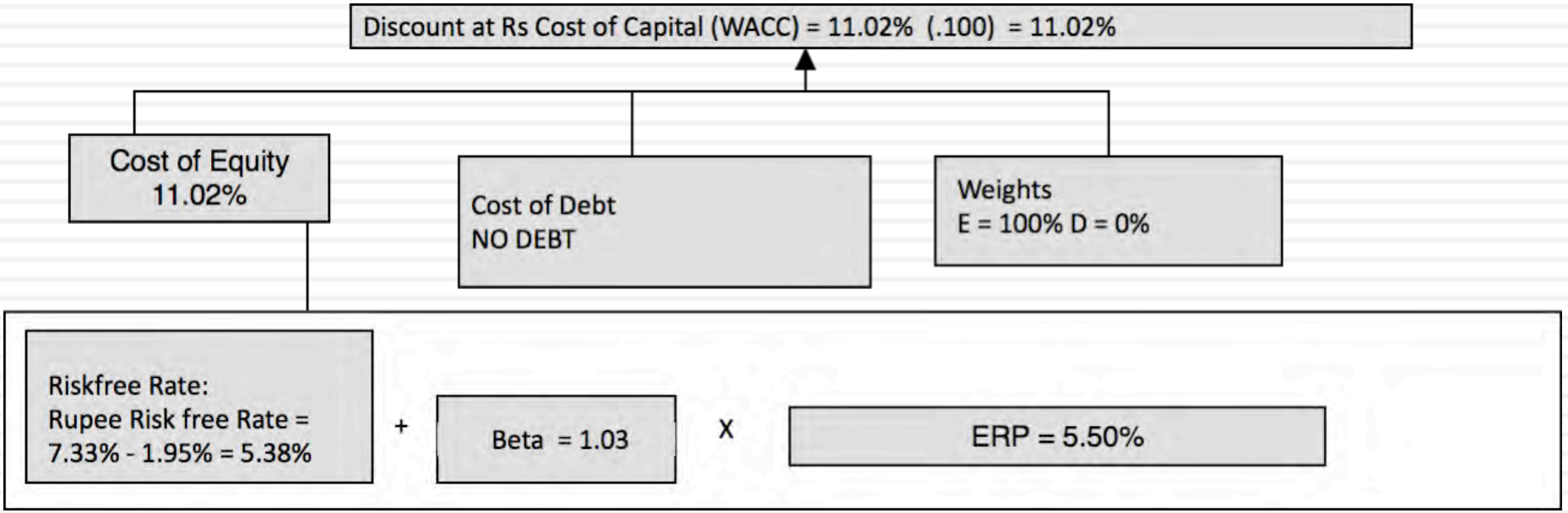
Equity Risk Premium
Premium investors demand over and above the risk free rate for investing in equities as a class.

Function of the countries that you do business in and how much value you derive from each country.

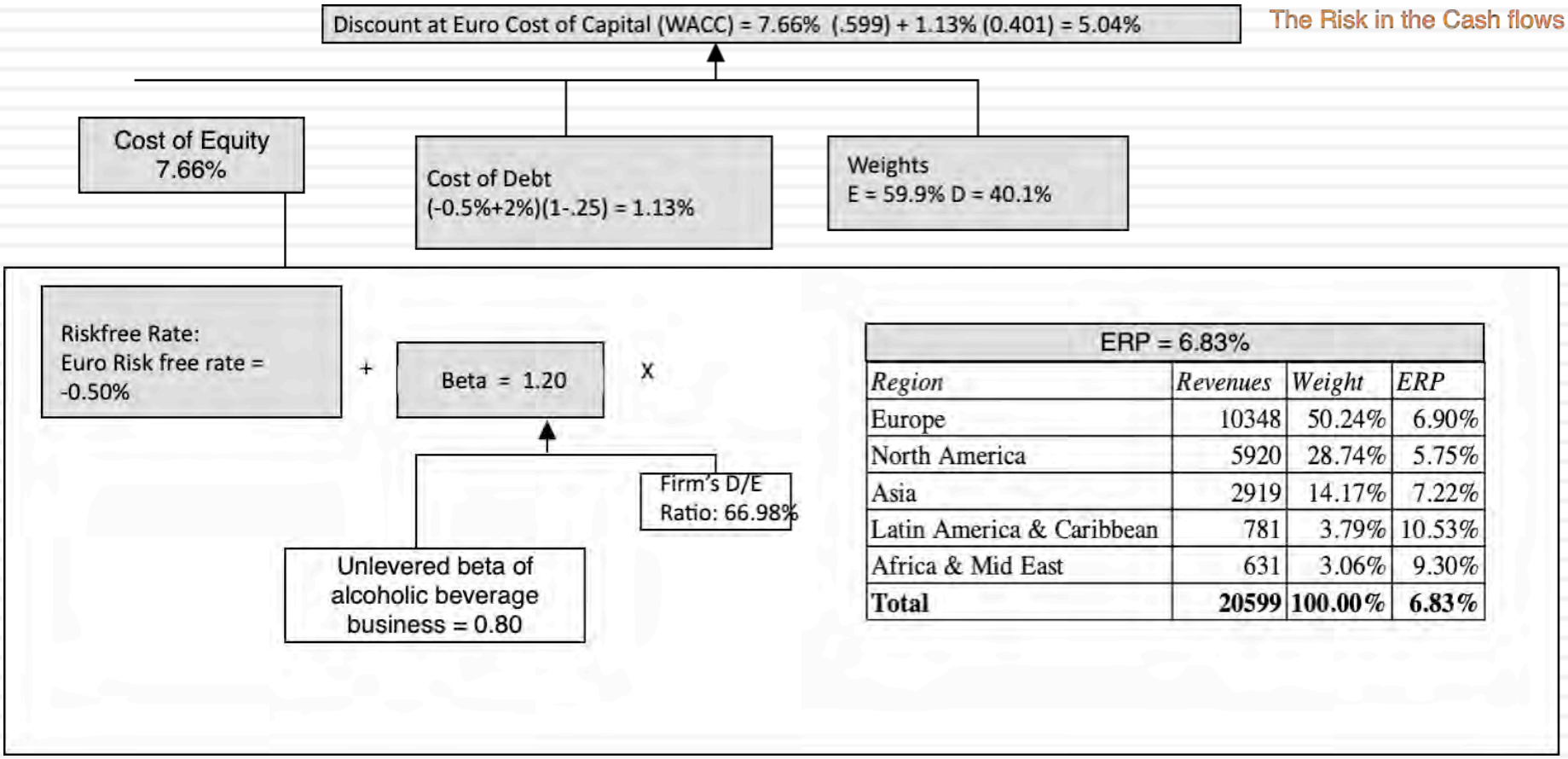
Shell's Cost of Capital in US$ in 2016

Business	% of Company	Unlevered Beta	D/E Ratio	Beta	**Cost of Equity (in US$)**	
Upstream	56.56%	1.13	30.63%	1.39	**13.47%**	
Downstream	43.44%	0.85	30.63%	1.05	**10.63%**	
Shell	100.00%	1.01	30.63%	1.24	**12.24%**	
Business	Cost of Equity	E/(D+E)	Pre-tax Cost of Debt	After-tax Cost of debt	D/(D+E)	**Cost of Capital**
Upstream	13.47%	76.55%	3.10%	2.33%	23.45%	**10.86%**
Downstream	10.63%	76.55%	3.10%	2.33%	23.45%	**8.68%**
Shell	12.24%	76.55%	3.10%	2.33%	23.45%	**9.91%**

Infosys: Cost of Capital in Indian Rupees in 2018

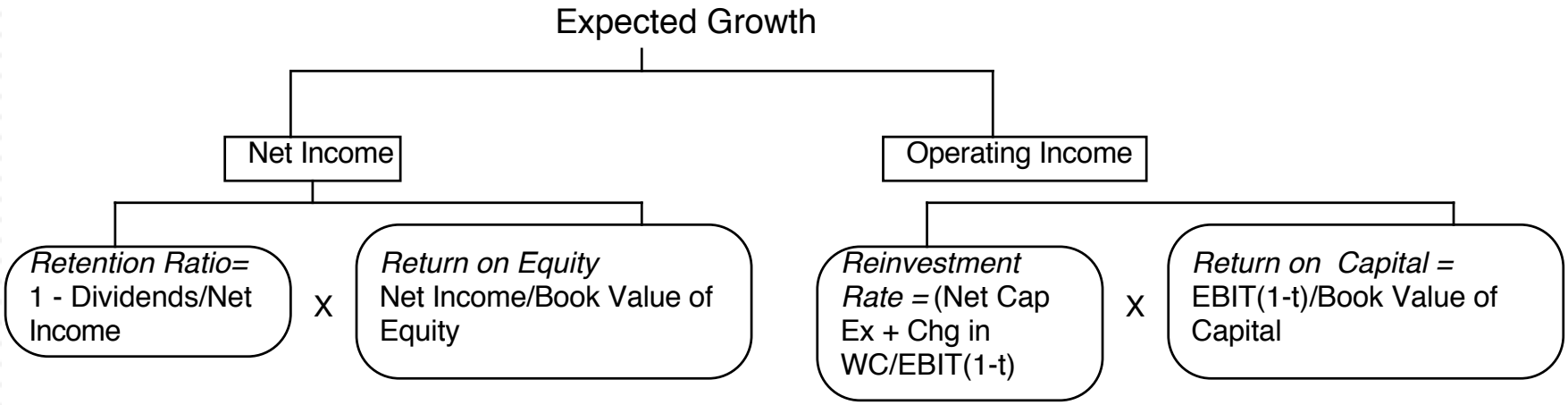


Heineken: Cost of Capital in Euros in September 2019



ERP = 6.83%			
Region	*Revenues*	*Weight*	*ERP*
Europe	10348	50.24%	6.90%
North America	5920	28.74%	5.75%
Asia	2919	14.17%	7.22%
Latin America & Caribbean	781	3.79%	10.53%
Africa & Mid East	631	3.06%	9.30%
Total	**20599**	**100.00%**	**6.83%**

C. Expected Growth



- Quality growth is rare and requires that a firm be able to reinvest a lot and reinvest well (earnings more than your cost of capital) at the same time.
- The larger you get, the more difficult it becomes to maintain quality growth.
- You can grow while destroying value at the same time.

A More General Structure

- When operating income is negative or margins are expected to change over time, I use a three-step process to estimate growth:
  - Estimate growth rates in revenues over time
    - Determine the total market (given your business model) and estimate the market share that you think your company will earn.
    - Decrease the growth rate as the firm becomes larger
    - Keep track of absolute revenues to make sure that the growth is feasible
  - Estimate expected operating margins each year
    - Set a target margin that the firm will move towards
    - Adjust the current margin towards the target margin
  - Estimate the capital that needs to be invested to generate revenue growth and expected margins
    - Estimate a sales to capital ratio that you will use to generate reinvestment needs each year.

1. Currencies matter

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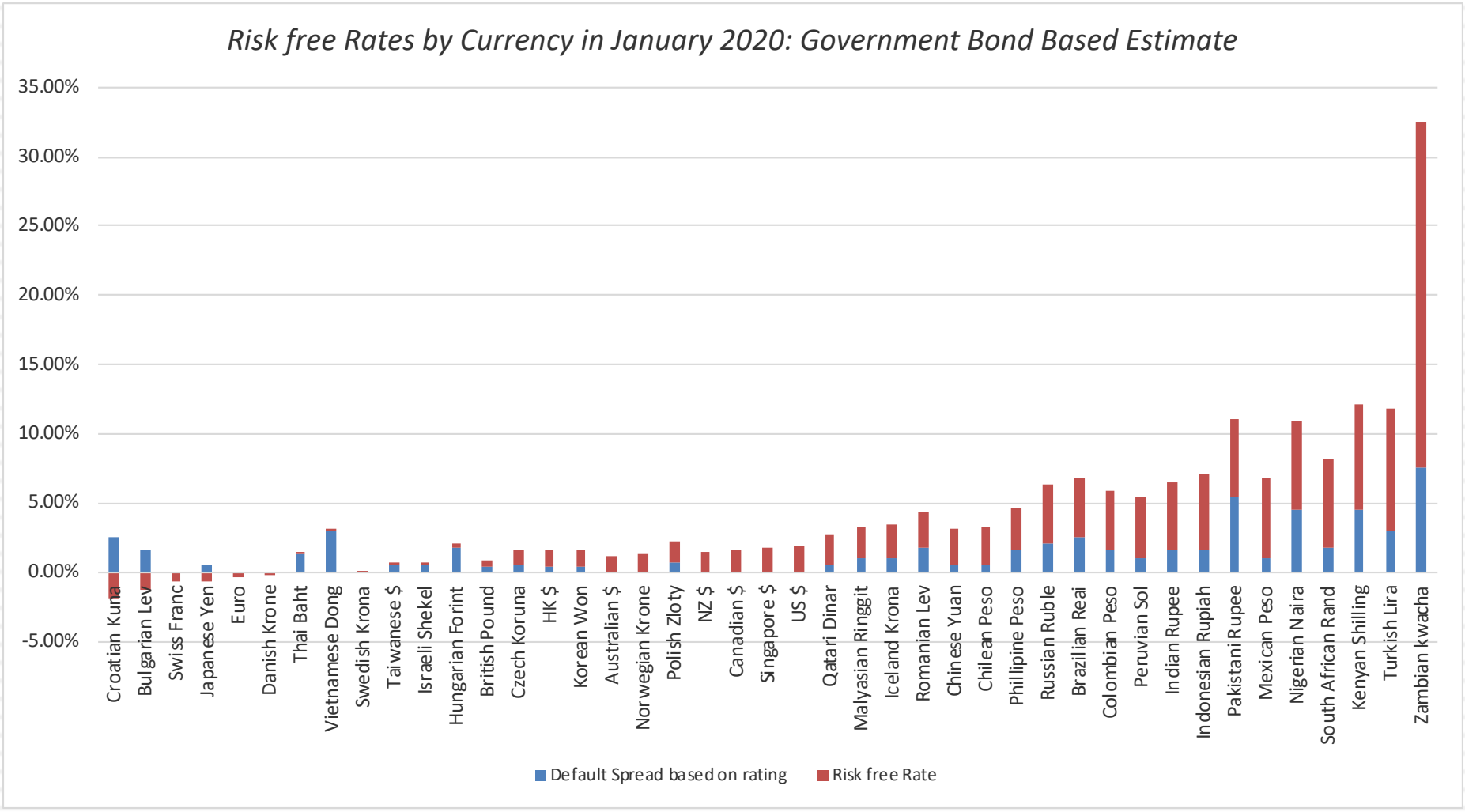
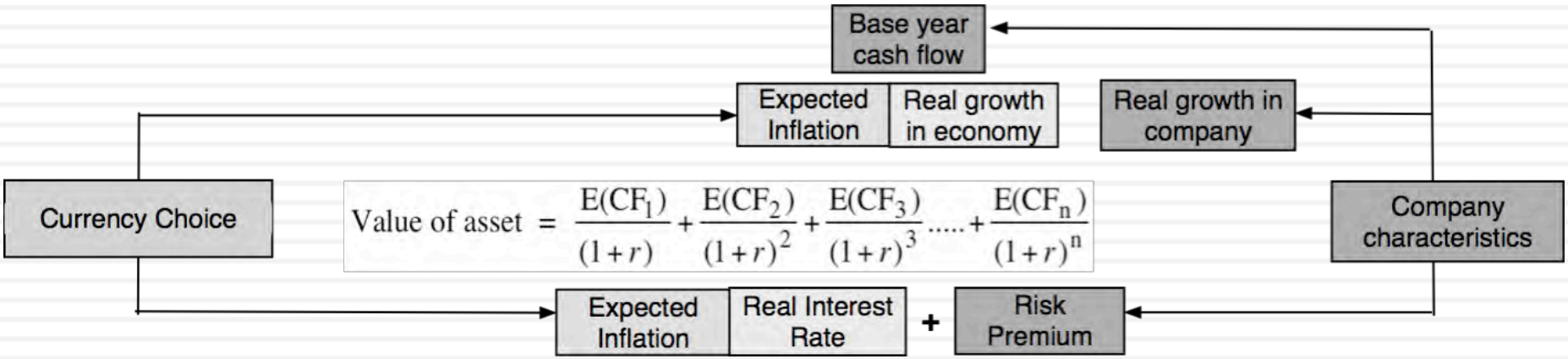


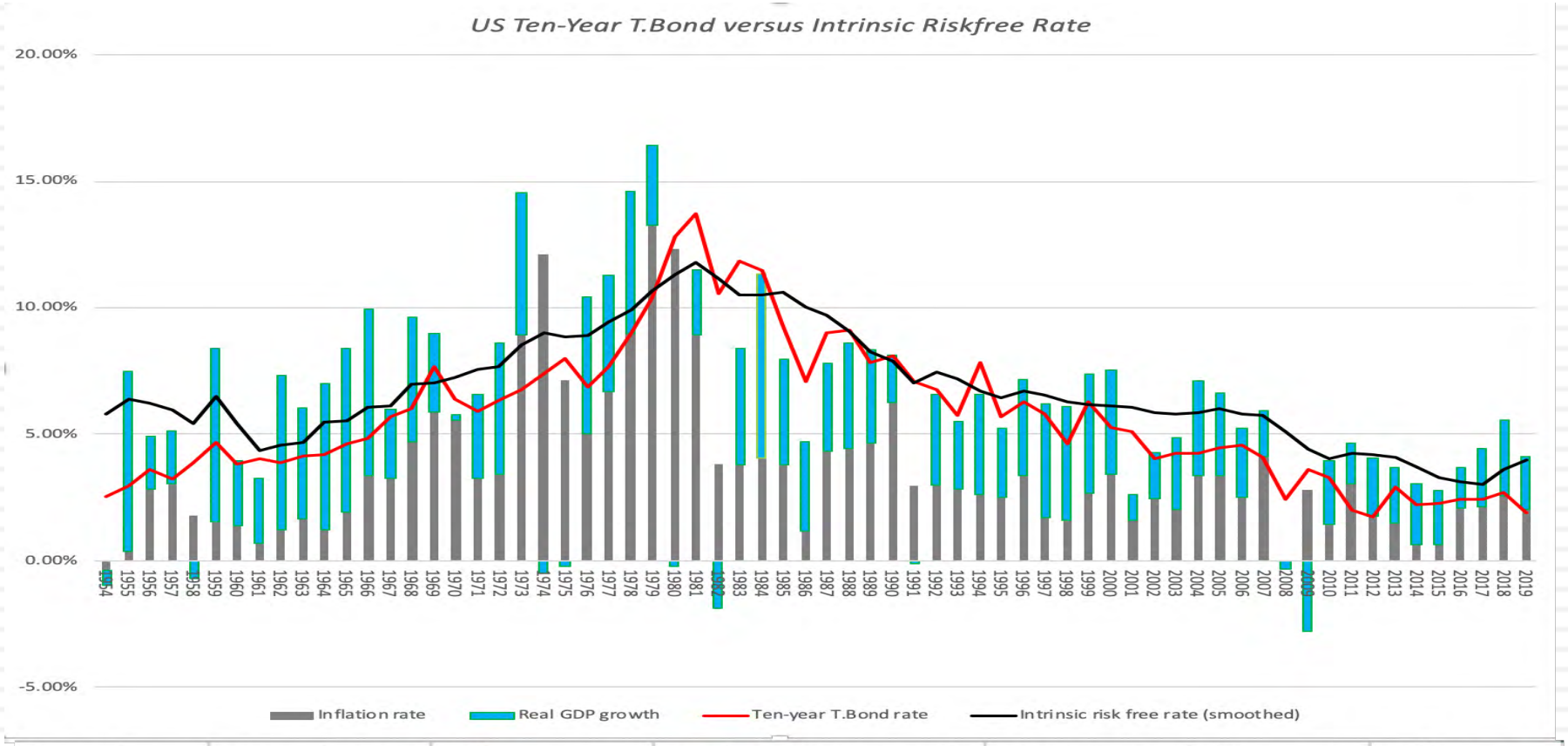
But not to value…



Valuing Infosys in Rupees and Dollars

	In Rupees	In Dollars
Risk free Rate	5.38%	2.85%
Expected growth rate	10.00% for next 5 years, scaling down to 5.38% in year 10 (and forever)	7.37% for next 5 years, scaling down to 2.85% in year 10 (and forever)
Return on Capital	Marginal ROIC of 39.70%, scaling down to 15% forever	Marginal ROIC of 37.68%, scaling down to 12.36% forever.
Cost of capital	11.02% for next 5 years, scaling down to 9.88% in year 10 (and beyond)	8.36% for next 5 years, scaling down to 7.23% in year 10 (and beyond)
Value per share	Rs 1072.22 per share about 7% below stock price of Rs 1,150/share	$16.86 per share about 7% below stock price of $18.02/share

Some perspective on risk free rates



Period	T.Bond Rate	Inflation rae	Real GDP Growqth	Intrinsic Risk free rate	Difference
1954-2019	5.72%	3.53%	3.01%	6.54%	-0.82%
1954-1980	5.83%	4.49%	3.50%	7.98%	-2.15%
1981-2008	6.88%	3.26%	3.04%	6.30%	0.58%
2010-2019	2.38%	1.86%	1.72%	3.58%	-1.03%

2. Risk is not in the past..

	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2019	8.18%	6.43%	6.35%	4.83%
Std Error	2.08%	2.20%		
1970-2019	7.26%	4.50%	5.93%	3.52%
Std Error	2.38%	2.73%		
2010-2019	13.51%	9.67%	12.93%	9.31%
Std Error	3.85%	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 backward looking, is noisy and may reflect selection bias.

But in the future..

Base year cash flow (last 12 mths)
Dividends (TTM): 57.71
+ Buybacks (TTM): 92.80
= Cash to investors (TTM): **150.50**

Expected cashflow growth in next 5 years
Cash flow growth = Top down analyst estimate of earnings growth for S&P 500 = 3.96%

	Last 12 months	2020	2021	2022	2023	2024	Term Year
Expected Earnings	153.52	159.59	165.90	172.47	179.29	186.38	189.96
Expected Dividends + Buybacks	150.50	156.46	162.65	169.08	175.77	182.73	186.24

Earnings and Cash flows grow @1.92% (set equal to risk free rate) a year forever.

S&P 500 on 1/1/20= **3230.78**

$$3230.78 = \frac{156.46}{(1+r)} + \frac{162.25}{(1+r)^2} + \frac{169.08}{(1+r)^3} + \frac{175.77}{(1+r)^4} + \frac{182.73}{(1+r)^5} + \frac{182.73\,(1.0192)}{(r-.0192)(1+r)^5}$$

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 = 7.12%

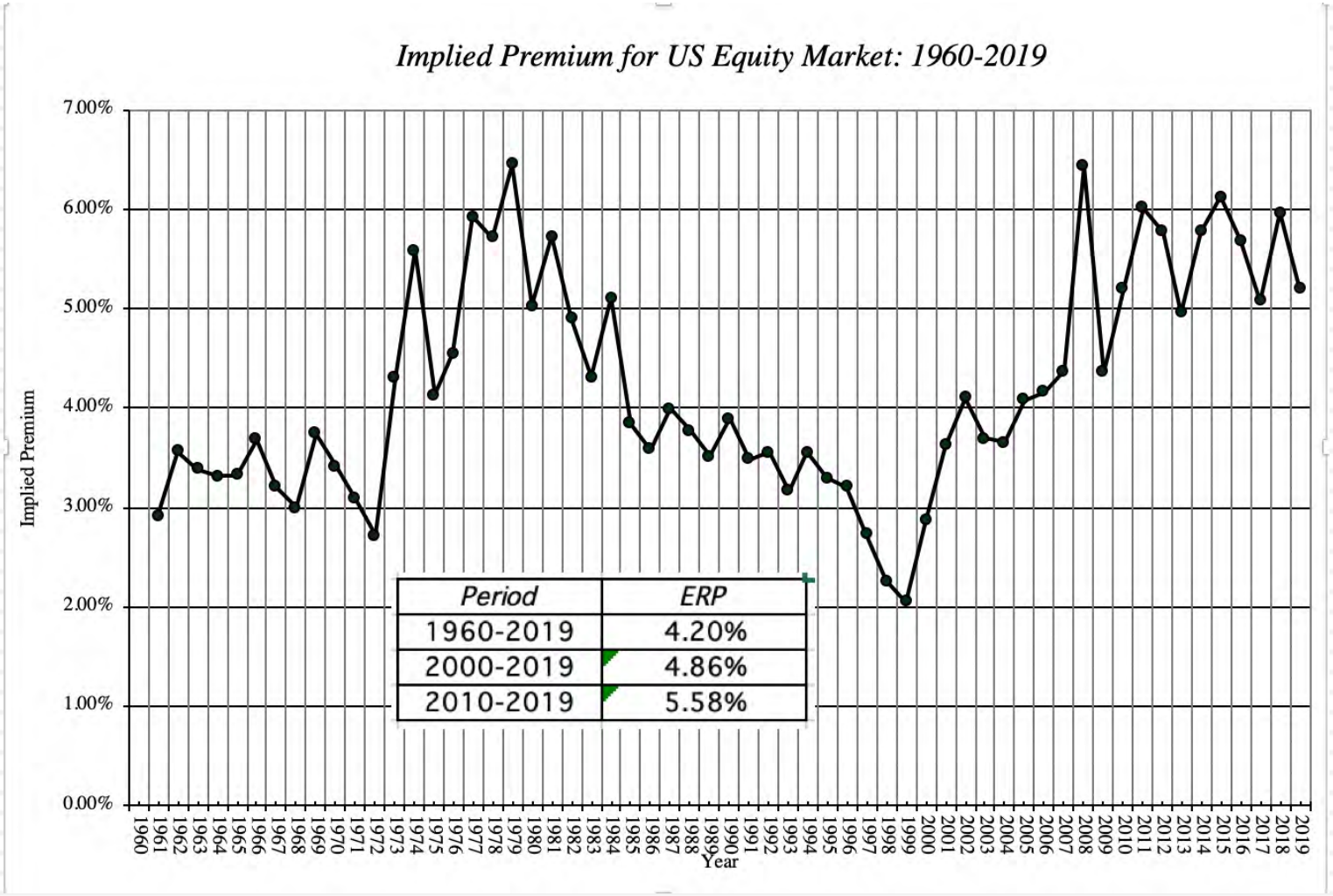
Minus

Risk free rate = T.Bond rate on 1/1/20= 1.92%

Equals

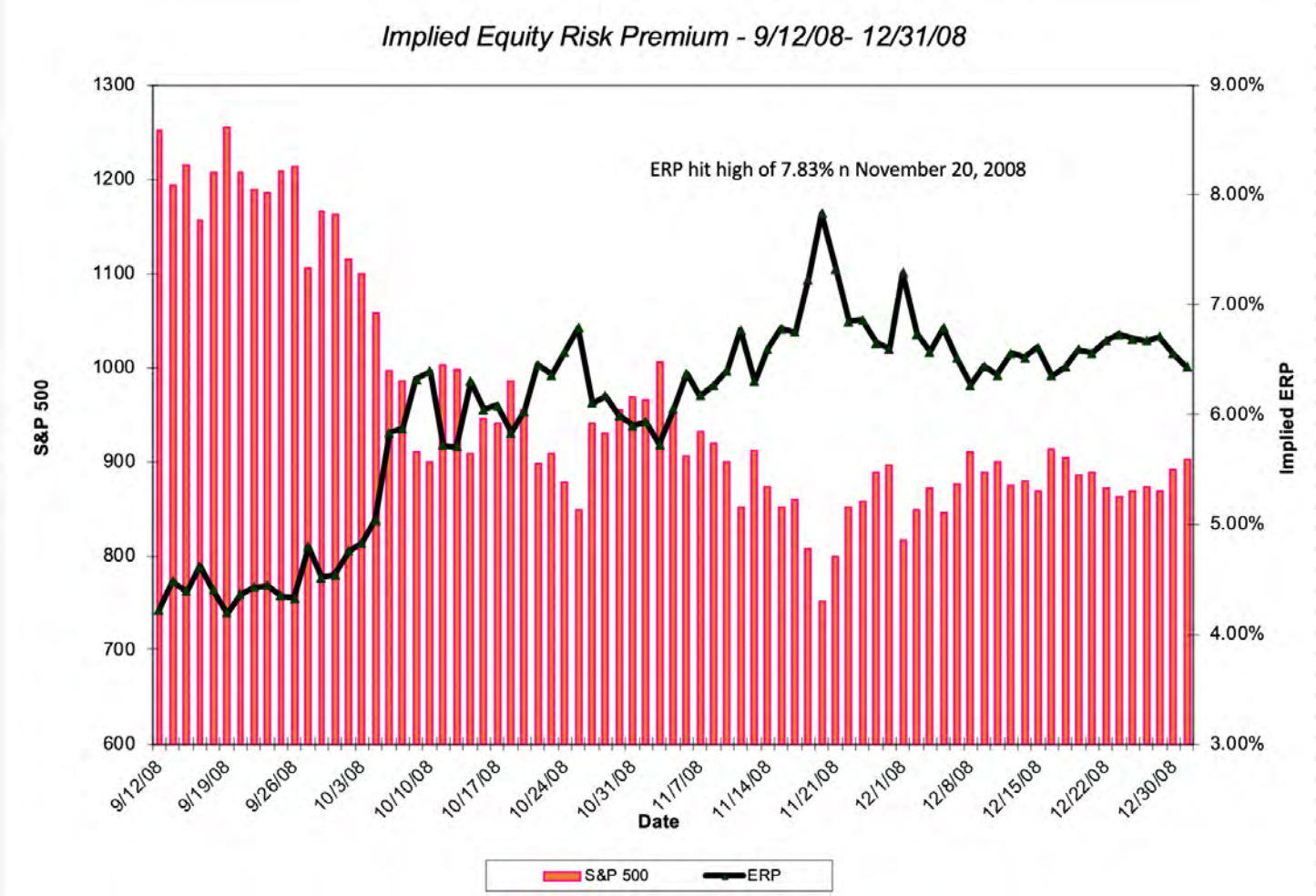
Implied Equity Risk Premium (1/1/20) = 7.12% - 1.92% = **5.20%**

Implied ERP for the S&P 500: History

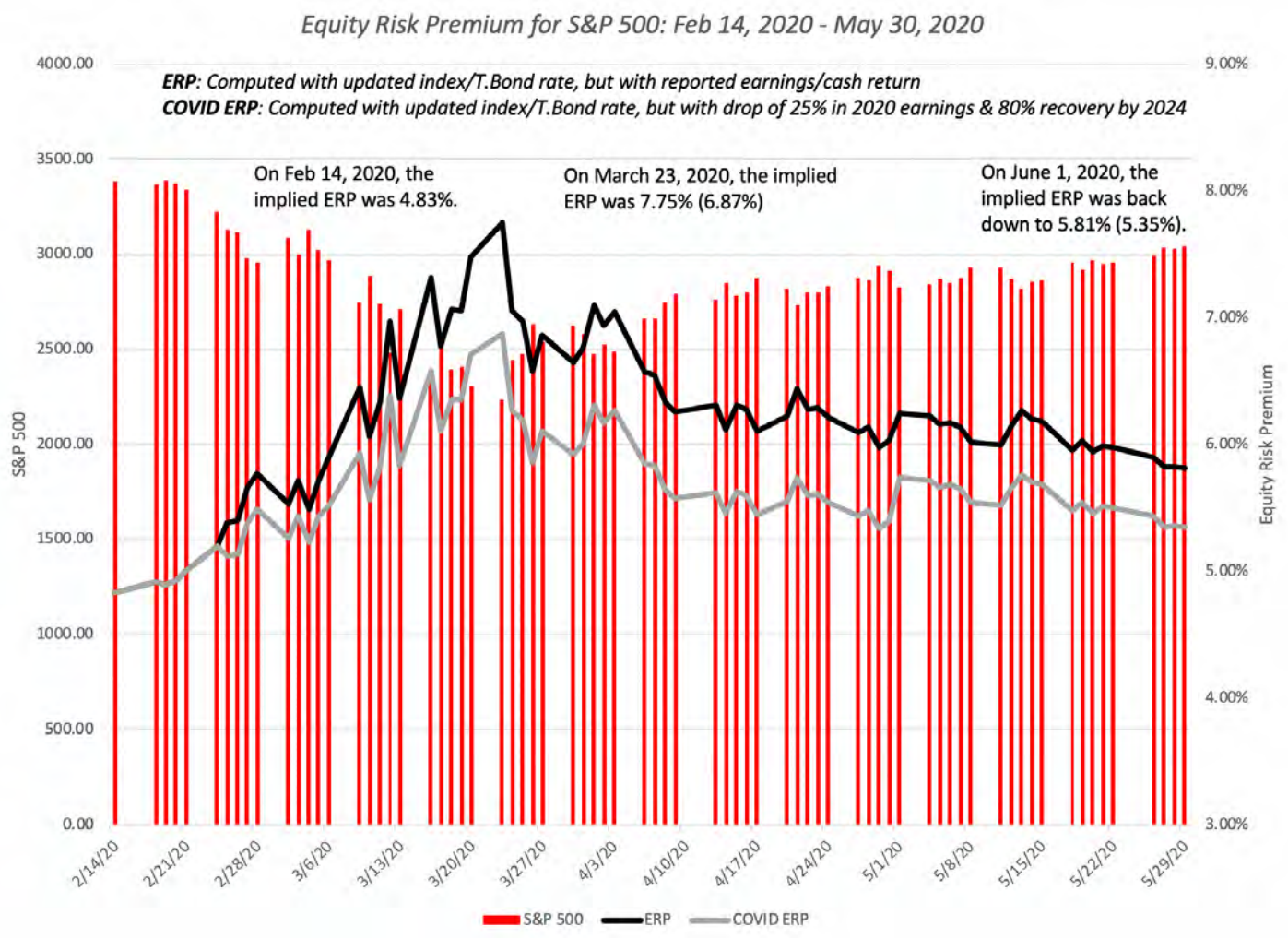


Period	ERP
1960-2019	4.20%
2000-2019	4.86%
2010-2019	5.58%

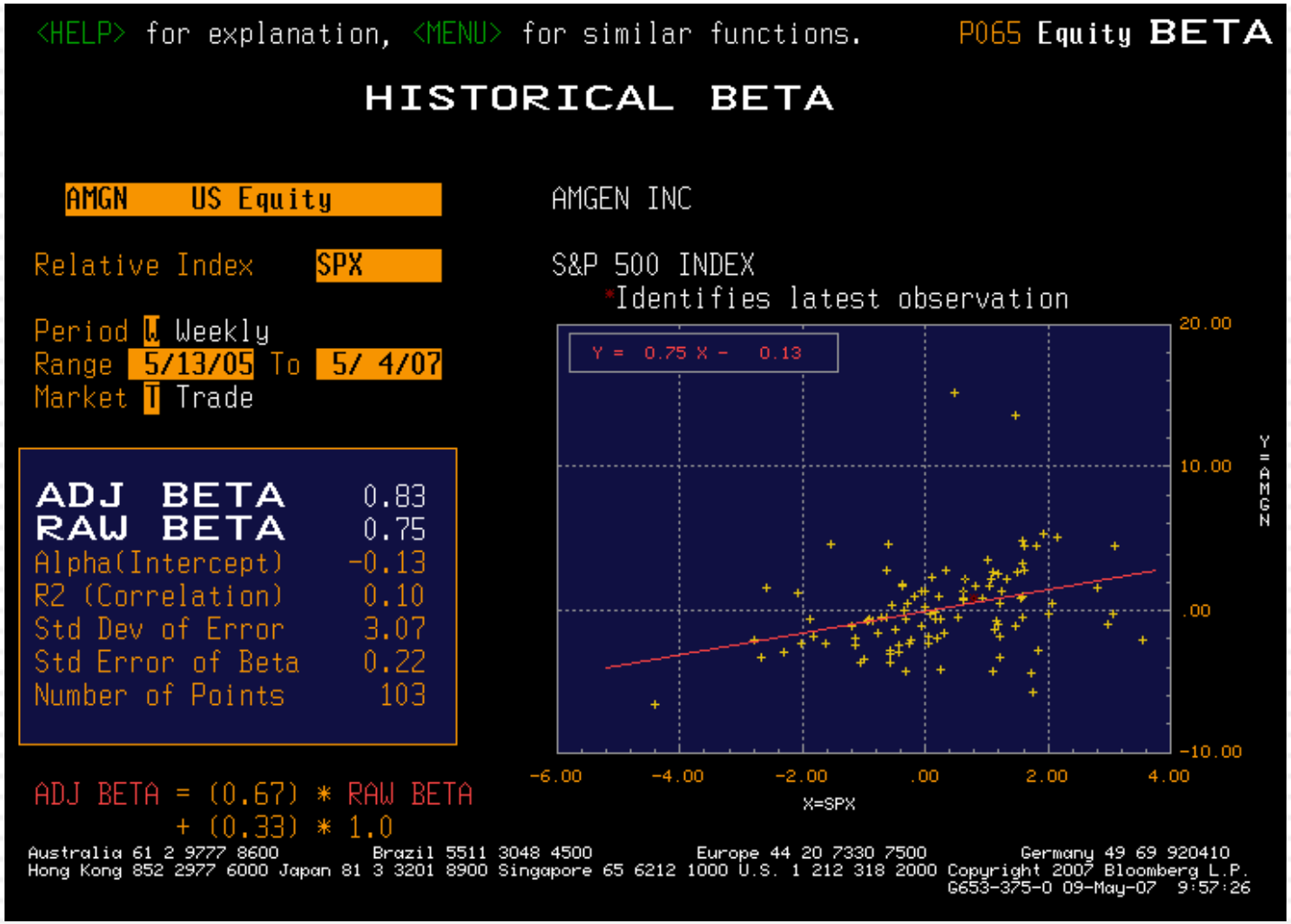
The Price of Risk: The 2008 Crisis



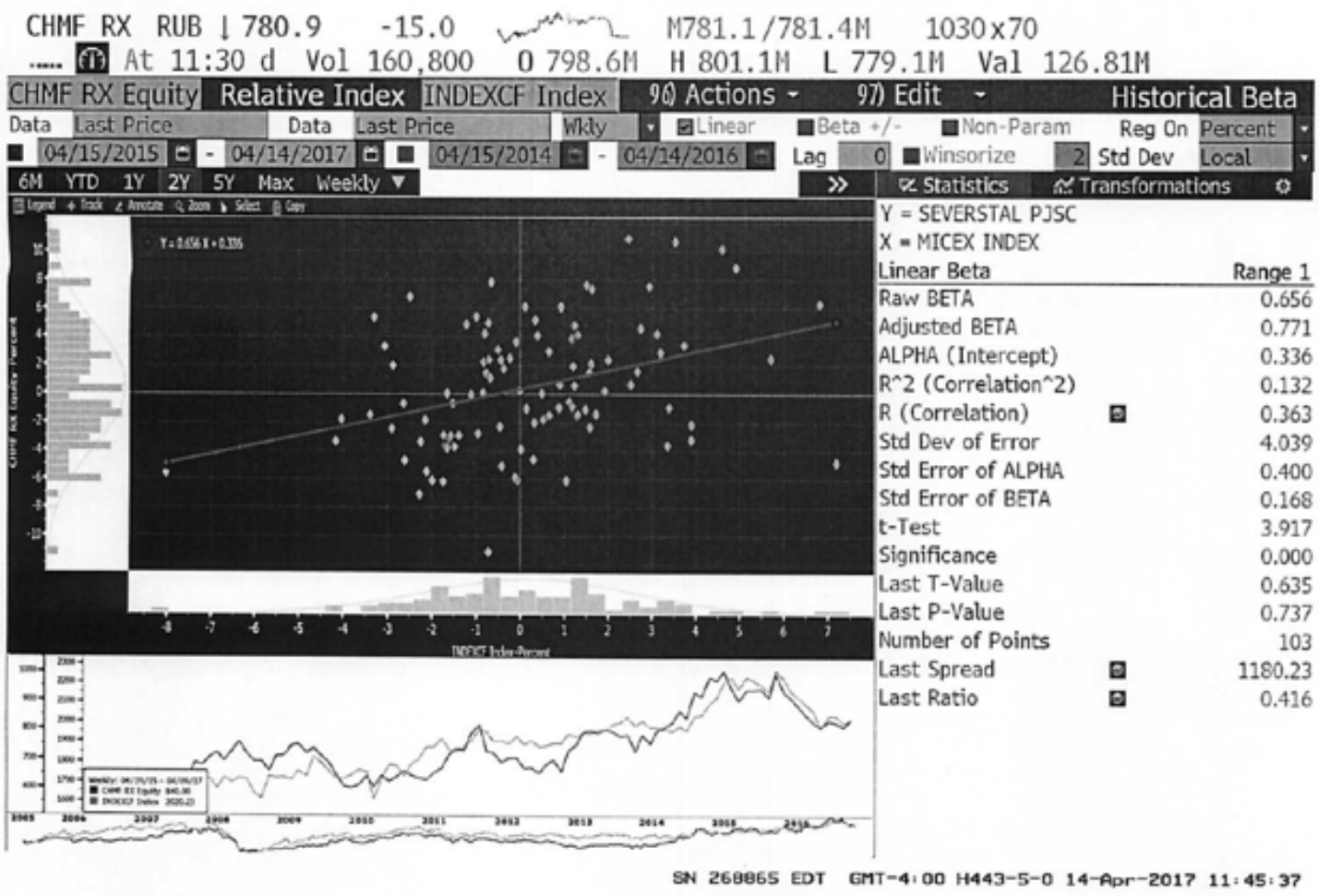
The Price of Risk: The COVID crisis



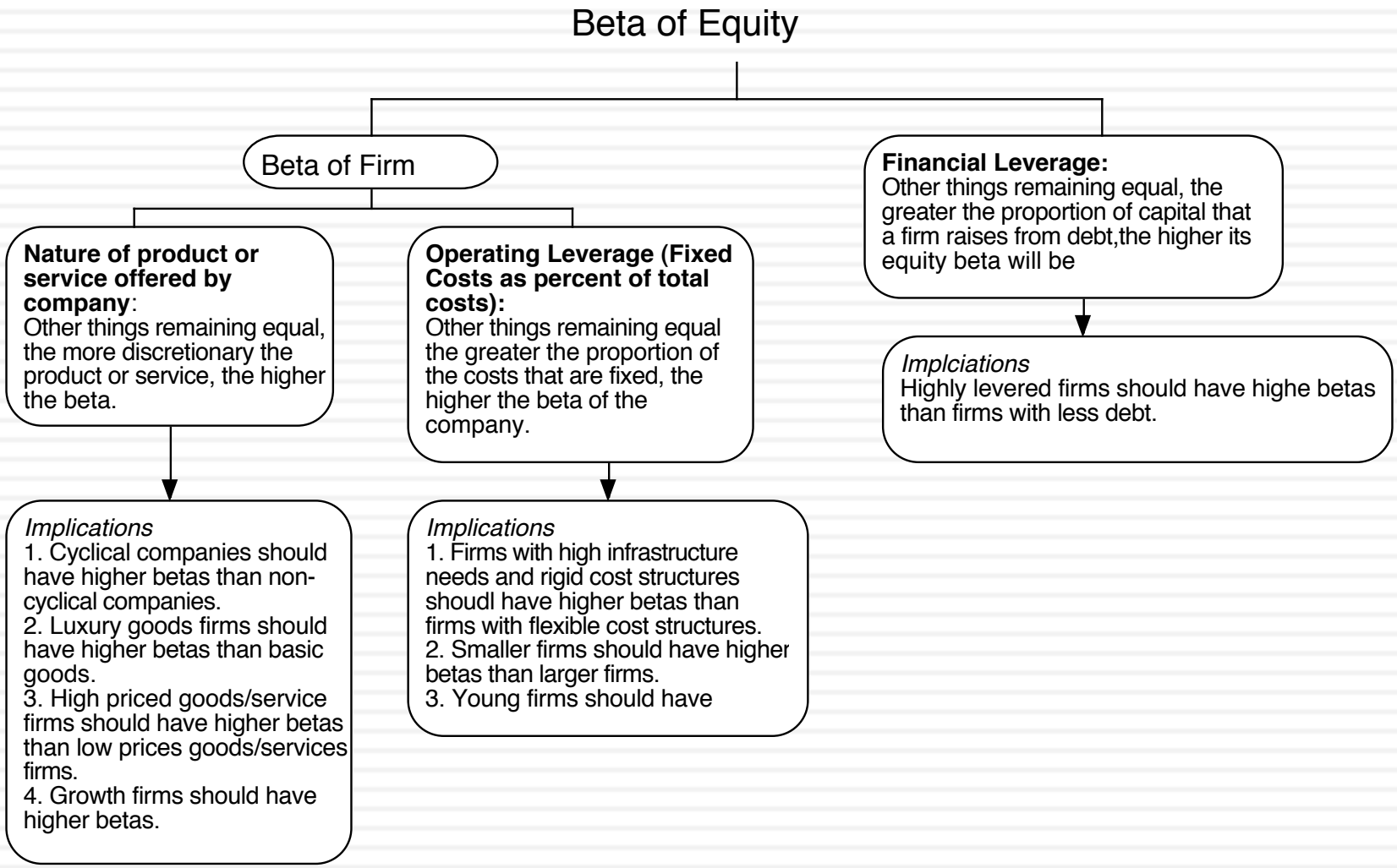
3. Beta is not just a Greek alphabet!



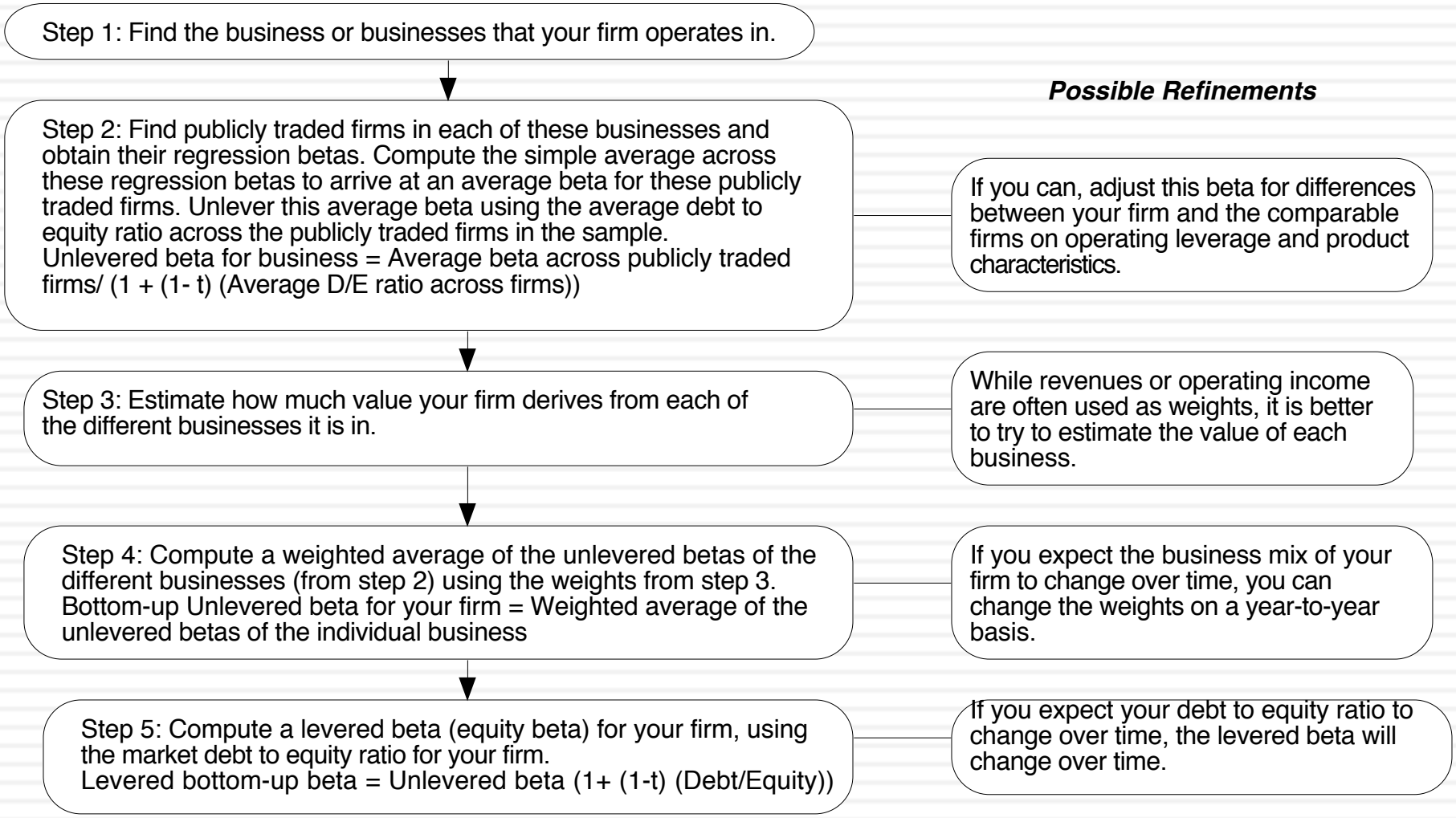
And can be meaningless if run against narrow indices..



Determinants of Betas



Bottom-up Betas



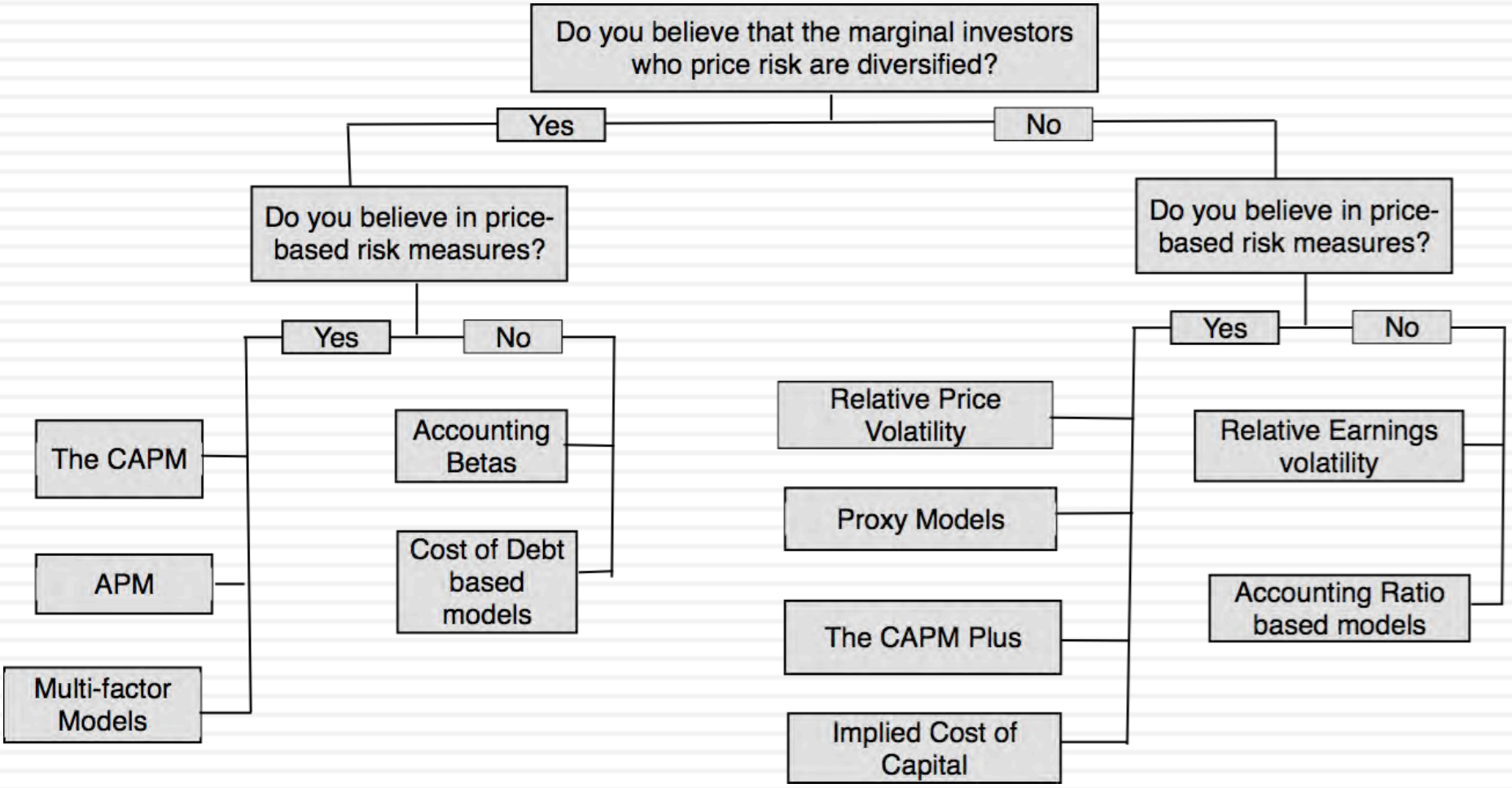
Three examples…

- Amgen
  - The unlevered beta for pharmaceutical firms is 1.59. Using Amgen's debt to equity ratio of 11%, the bottom up beta for Amgen is
  - Bottom-up Beta = 1.59 (1+ (1-.35)(.11)) = 1.73
- Tata Motors
  - The unlevered beta for automobile firms is 0.98. Using Tata Motor's debt to equity ratio of 33.87%, the bottom up beta for Tata Motors is
  - Bottom-up Beta = 0.98 (1+ (1-.3399)(.3387)) = 1.20
- Severstal

Business	*Revenues*	*EV/Sales*	*Estimated Value*	*Unlevered Beta*
Steel	$5,462.00	1.0645	$5,814.36	0.7355
Metals & Mining	$1,154.00	1.6943	$1,955.23	0.9178
Severstal	$6,616.00		$7,769.59	0.7814

$$\text{Levered Beta} = 0.7814\ (1+(1-.20)(.2597)) = 0.94$$

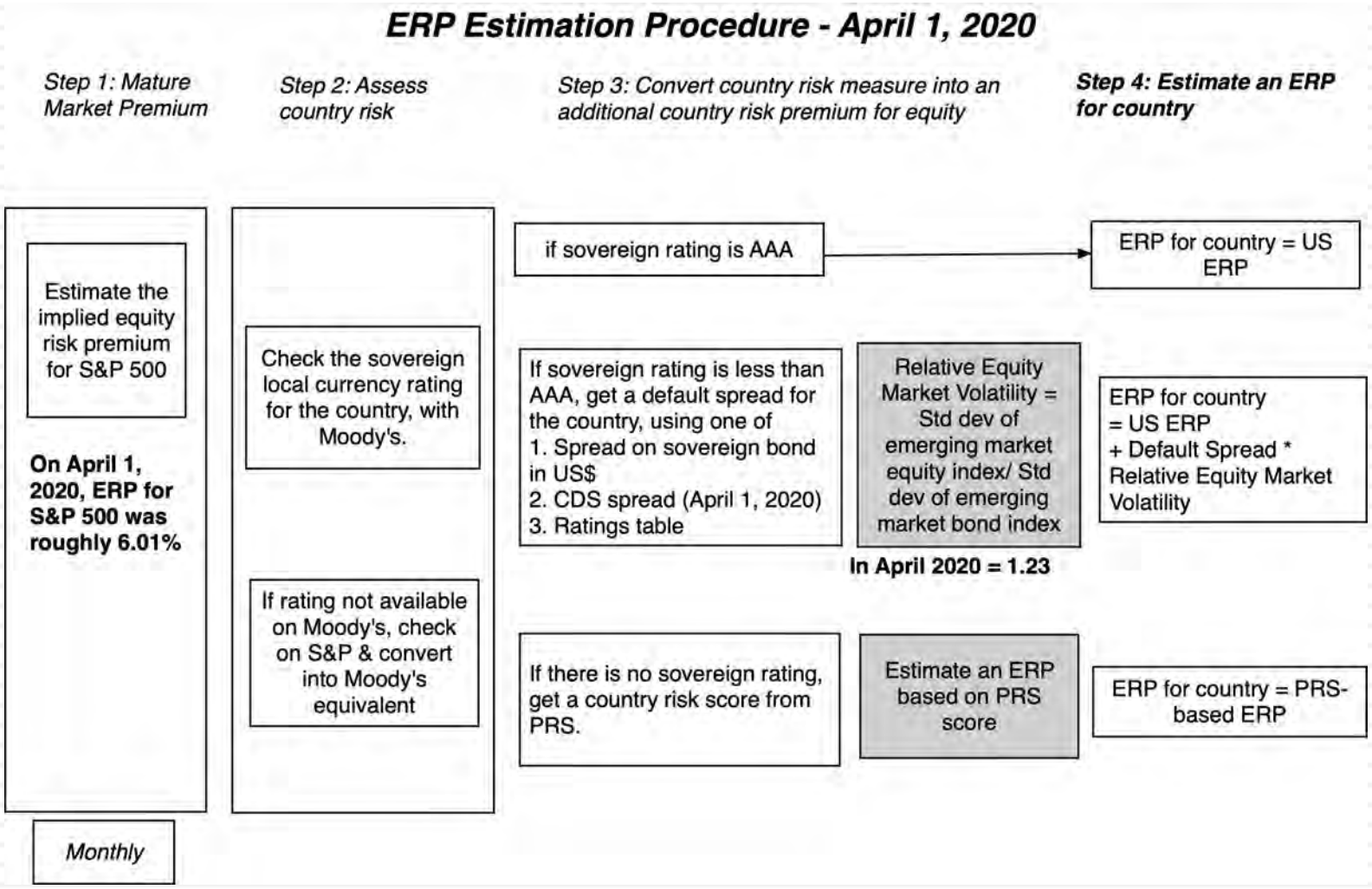
Measuring Relative Risk: You don't like betas or modern portfolio theory? No problem.



4. 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.

A Template for Estimating the ERP: April 1, 2020



ERP : April 1, 2020

Andorra	9.49%	7.08%
Austria	6.74%	5.59%
Belgium	7.12%	5.80%
Cyprus	11.51%	8.16%
Denmark	6.01%	5.20%
Finland	6.74%	5.59%
France	6.92%	5.69%
Germany	6.01%	5.20%
Greece	14.25%	9.64%
Guernsey (States of)	8.93%	6.77%
Iceland	7.56%	6.04%
Ireland	7.56%	6.04%
Isle of Man	6.92%	5.69%
Italy	10.04%	7.37%
Jersey (States of)	7.30%	5.89%
Liechtenstein	6.01%	5.20%
Luxembourg	6.01%	5.20%
Malta	7.56%	6.04%
Netherlands	6.01%	5.20%
Norway	6.01%	5.20%
Portugal	10.04%	7.37%
Spain	8.93%	6.77%
Sweden	6.01%	5.20%
Switzerland	6.01%	5.20%
Turkey	14.25%	9.64%
United Kingdom	6.92%	5.69%
Western Europe	**7.51%**	**6.01%**

Canada	6.01%	5.20%
United States	6.01%	5.20%
North America	**6.01%**	**5.20%**

Argentina	22.49%	14.08%
Belize	17.91%	11.62%
Bolivia	12.60%	8.75%
Brazil	11.51%	8.16%
Chile	7.30%	5.89%
Colombia	9.49%	7.08%
Costa Rica	14.25%	9.64%
Ecuador	17.91%	11.62%
El Salvador	17.91%	14.08%
Guatemala	10.58%	7.66%
Honduras	14.25%	9.64%
Mexico	8.21%	6.38%
Nicaragua	16.08%	10.63%
Panama	8.93%	6.77%
Paraguay	10.58%	7.66%
Peru	8.21%	6.38%
Suriname	16.08%	10.63%
Uruguay	9.49%	7.08%
Venezuela	24.52%	22.89%
Central and South America	**11.79%**	**8.48%**

Angola	17.91%	11.62%
Benin	16.08%	10.63%
Botswana	7.56%	6.04%
Burkina Faso	16.08%	10.63%
Cameroon	16.08%	10.63%
Cape Verde	16.08%	10.63%
Congo (DR)	19.73%	12.59%
Congo (Republic of)	22.49%	14.08%
Côte d'Ivoire	12.60%	8.75%
Egypt	16.08%	10.63%
Ethiopia	14.25%	9.64%
Gabon	19.73%	12.59%
Ghana	17.91%	11.62%
Kenya	16.08%	10.63%
Mali	17.91%	11.62%
Morocco	10.58%	7.66%
Mozambique	22.49%	14.08%
Namibia	11.51%	8.16%
Niger	17.91%	11.62%
Nigeria	16.08%	10.63%
Rwanda	16.08%	10.63%
Senegal	12.60%	8.75%
South Africa	10.58%	7.37%
Swaziland	16.08%	10.63%
Tanzania	14.25%	9.64%
Togo	17.91%	11.62%
Tunisia	16.08%	10.63%
Uganda	16.08%	10.63%
Zambia	24.52%	14.08%
Africa	**14.71%**	**9.89%**

Albania	14.25%	9.64%
Armenia	12.60%	8.75%
Azerbaijan	11.51%	8.16%
Belarus	17.91%	11.62%
Bosnia and Herzegovina	17.91%	11.62%
Bulgaria	9.49%	7.08%
Croatia	11.51%	8.16%
Czech Republic	7.12%	5.80%
Estonia	7.30%	5.89%
Georgia	11.51%	8.16%
Hungary	10.04%	7.37%
Kazakhstan	10.04%	7.37%
Kyrgyzstan	16.08%	10.63%
Latvia	8.21%	6.38%
Lithuania	8.21%	6.38%
Macedonia	12.60%	8.75%
Moldova	17.91%	11.62%
Montenegro	14.25%	9.64%
Poland	7.56%	6.04%
Romania	10.04%	7.37%
Russia	10.04%	7.37%
Serbia	12.60%	8.75%
Slovakia	7.56%	6.04%
Slovenia	8.93%	6.77%
Tajikistan	17.91%	11.62%
Ukraine	19.73%	12.59%
Uzbekistan	14.25%	9.64%
Eastern Europe & Russia	**9.98%**	**7.34%**

Abu Dhabi	6.92%	5.69%
Bahrain	16.08%	10.63%
Iraq	19.73%	12.59%
Israel	7.30%	5.89%
Jordan	14.25%	9.64%
Kuwait	6.92%	5.69%
Lebanon	24.52%	14.08%
Oman	11.51%	7.66%
Qatar	7.12%	5.80%
Ras Al Khaimah (Er	19.73%	12.59%
Saudi Arabia	7.30%	5.89%
Sharjah	9.49%	6.38%
United Arab Emirate	6.92%	5.69%
Middle East	**8.93%**	**6.77%**

Country	*PRS Risk Score*	*ERP (4/1/20)*	*ERP (1/1/20)*
Algeria	63	17.91%	11.62%
Brunei	82.75	6.74%	5.59%
Gambia	63.75	17.91%	11.62%
Guinea	57	24.30%	15.06%
Guinea-Bissau	63.25	17.91%	11.62%
Guyana	63.75	17.91%	11.62%
Haiti	57.5	22.49%	14.08%
Iran	62.5	17.91%	11.62%
Korea, D.P.R.	50.5	27.03%	17.03%
Liberia	49.5	31.93%	21.71%
Libya	69.5	11.51%	8.16%
Madagascar	65.5	16.08%	10.63%
Malawi	63.5	17.91%	11.62%
Myanmar	64	17.91%	11.62%
Sierra Leone	57	24.30%	15.06%
Somalia	53	27.03%	17.03%
Sudan	39.75	31.93%	21.71%
Syria	53	27.03%	17.03%
Yemen, Republic	54.5	27.03%	17.03%
Zimbabwe	50.5	27.03%	17.03%

Bangladesh	12.60%	8.75%
Cambodia	16.08%	10.63%
China	7.30%	5.89%
Fiji	12.60%	8.75%
Hong Kong	7.12%	5.69%
India	9.49%	7.08%
Indonesia	9.49%	7.08%
Japan	7.30%	5.89%
Korea	6.92%	5.69%
Laos	8.21%	NA
Macao	7.12%	5.80%
Malaysia	8.21%	6.38%
Maldives	16.08%	10.63%
Mauritius	8.93%	6.77%
Mongolia	17.91%	11.62%
Pakistan	17.91%	11.62%
Papua New Guinea	16.08%	10.63%
Philippines	9.49%	7.08%
Singapore	6.01%	5.20%
Solomon Islands	17.91%	11.62%
Sri Lanka	16.08%	10.63%
Taiwan	7.12%	5.80%
Thailand	8.93%	6.77%
Vietnam	12.60%	8.75%
Asia	**7.89%**	**6.21%**

Australia	6.01%	5.20%
Cook Islands	14.25%	9.64%
New Zealand	6.01%	5.20%
Australia & NZ	**6.02%**	**5.20%**

Aswath Damodaran

Red: ERP on 4/1/20
Green: ERP on 1/1/20

And risk comes from where you operate, not where you incorporate! Infosys and Heineken

Infosys in 2017

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%

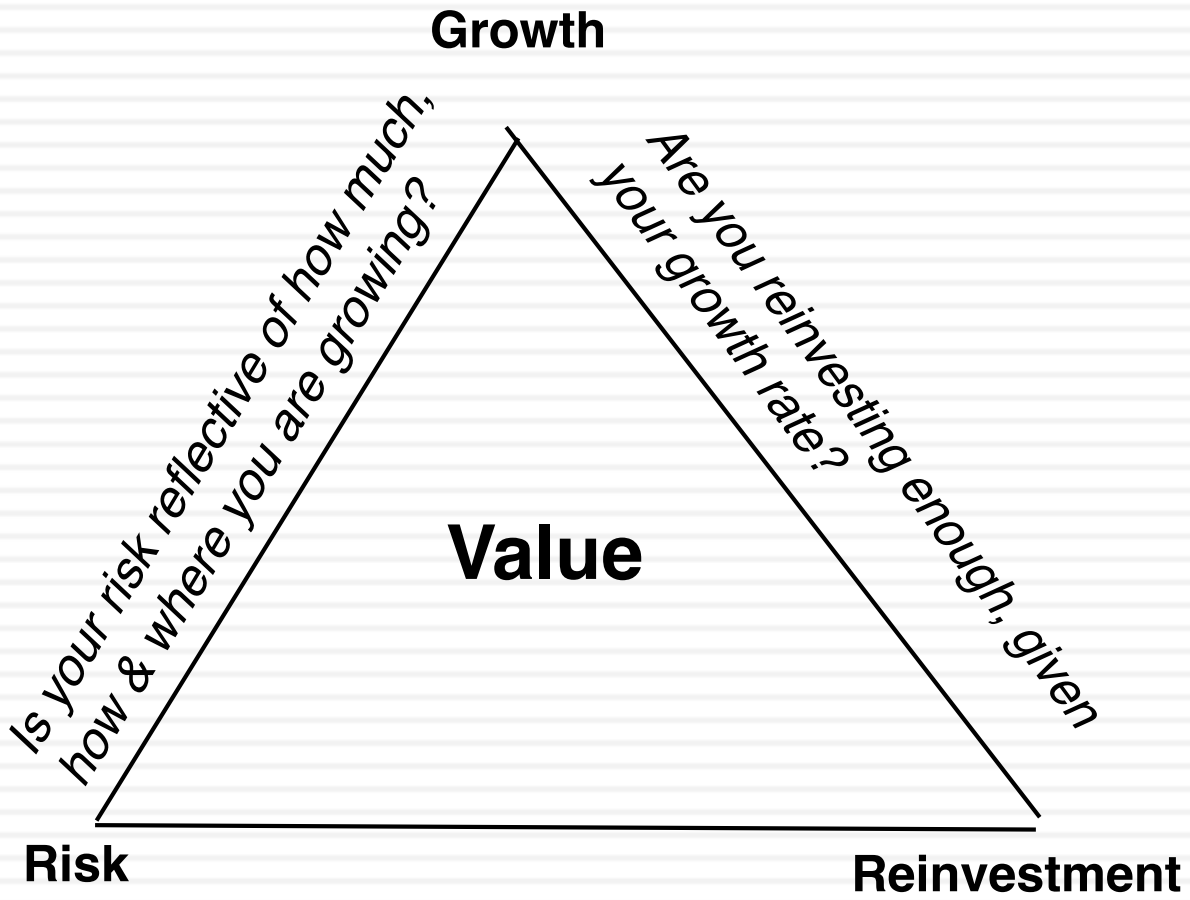
Heineken in 2019

Region	*Revenues*	*Weight*	*ERP*
Europe	€ 10,348	50.24%	6.90%
North America	€ 5,920	28.74%	5.75%
Asia	€ 2,919	14.17%	7.22%
Latin America & Caribbean	€ 781	3.79%	10.53%
Africa & Mid East	€ 631	3.06%	9.30%
Total	**€ 20,599**	**100.00%**	**6.83%**

Shell: Equity Risk Premium- March 2016

Country	*Oil & Gas Production*	*% of Total*	*ERP*
Denmark	17396	3.83%	6.20%
Italy	11179	2.46%	9.14%
Norway	14337	3.16%	6.20%
UK	20762	4.57%	6.81%
Rest of Europe	*874*	*0.19%*	*7.40%*
Brunei	823	0.18%	9.04%
Iraq	20009	4.40%	11.37%
Malaysia	22980	5.06%	8.05%
Oman	78404	17.26%	7.29%
Russia	22016	4.85%	10.06%
Rest of Asia & ME	*24480*	*5.39%*	*7.74%*
Oceania	*7858*	*1.73%*	*6.20%*
Gabon	12472	2.75%	11.76%
Nigeria	67832	14.93%	11.76%
Rest of Africa	6159	1.36%	12.17%
USA	104263	22.95%	6.20%
Canada	8599	1.89%	6.20%
Brazil	13307	2.93%	9.60%
Rest of Latin America	*576*	*0.13%*	*10.78%*
Royal Dutch Shell	**454326**	**100.00%**	**8.26%**

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



Is your risk consistent with your reinvestment strategy?

The Improbable: Willy Wonkitis

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

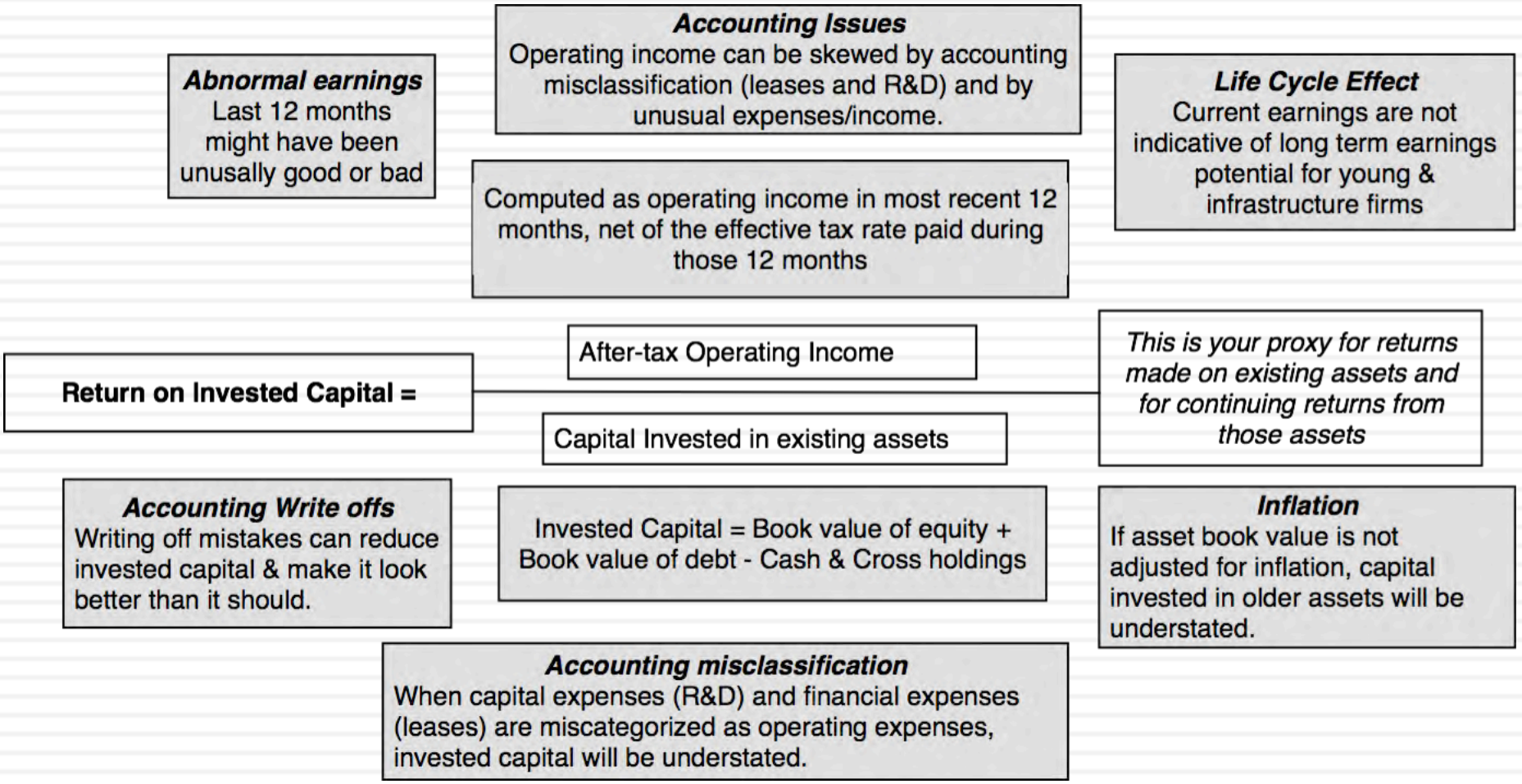
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Unit Volume	24,298	36,883	64,684	86,713	149,869	214,841	291,861	384,747	466,559	550,398	643,850	726,655	820,645	922,481	1,034,215	1,137,780
% Growth		52%	75%	34%	73%	43%	36%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

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

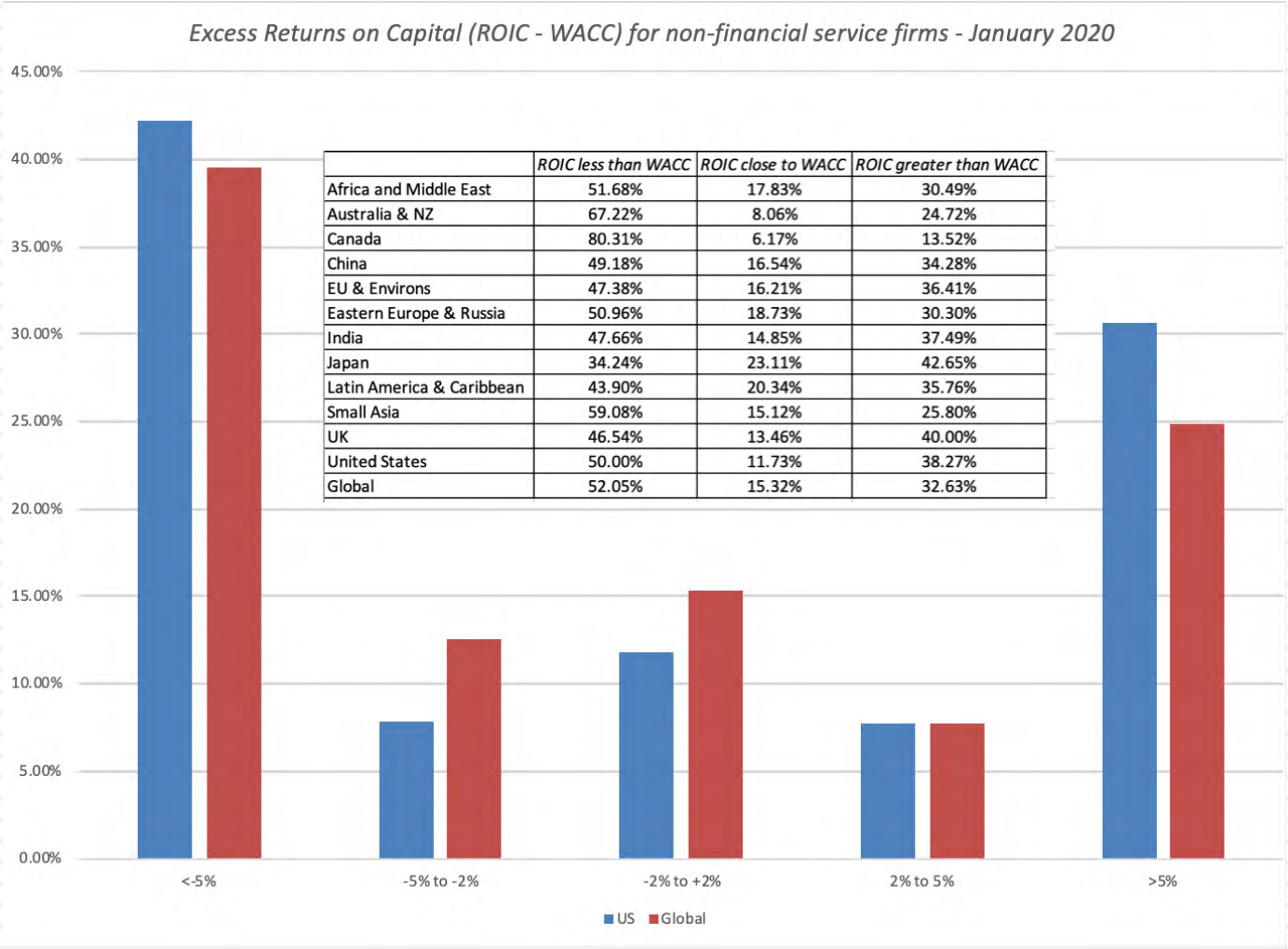
Exit EBITDA High	12.0 x	Exit PPG High	5.0%	Exit P/Sales High	180%
Exit EBITDA Low	8.0 x	Exit PPG Low	3.0%	Exit P/Sales Low	130%

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

The Magical Number: ROIC (or any accounting return) and its limits

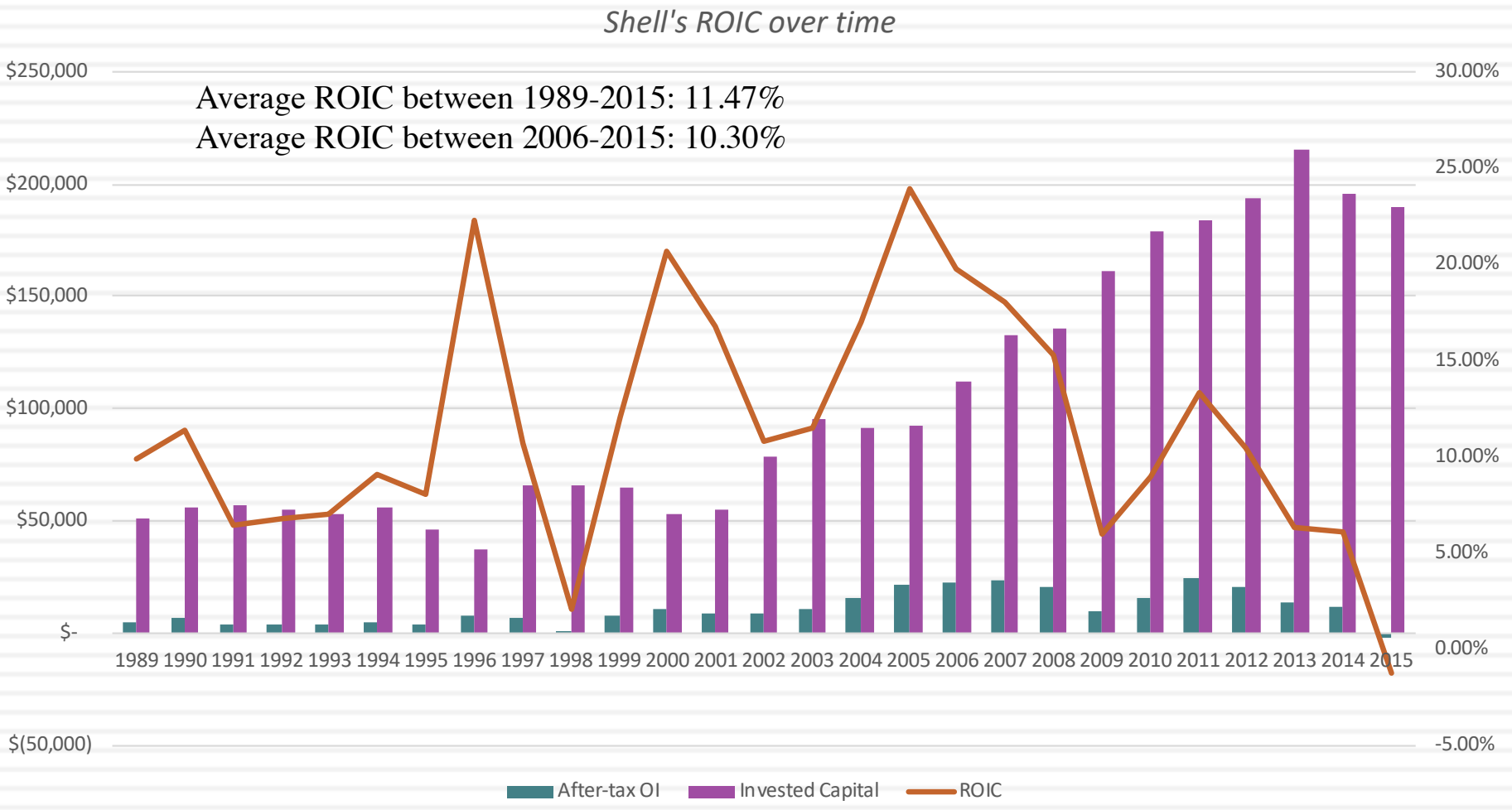


And consider the trade offs..

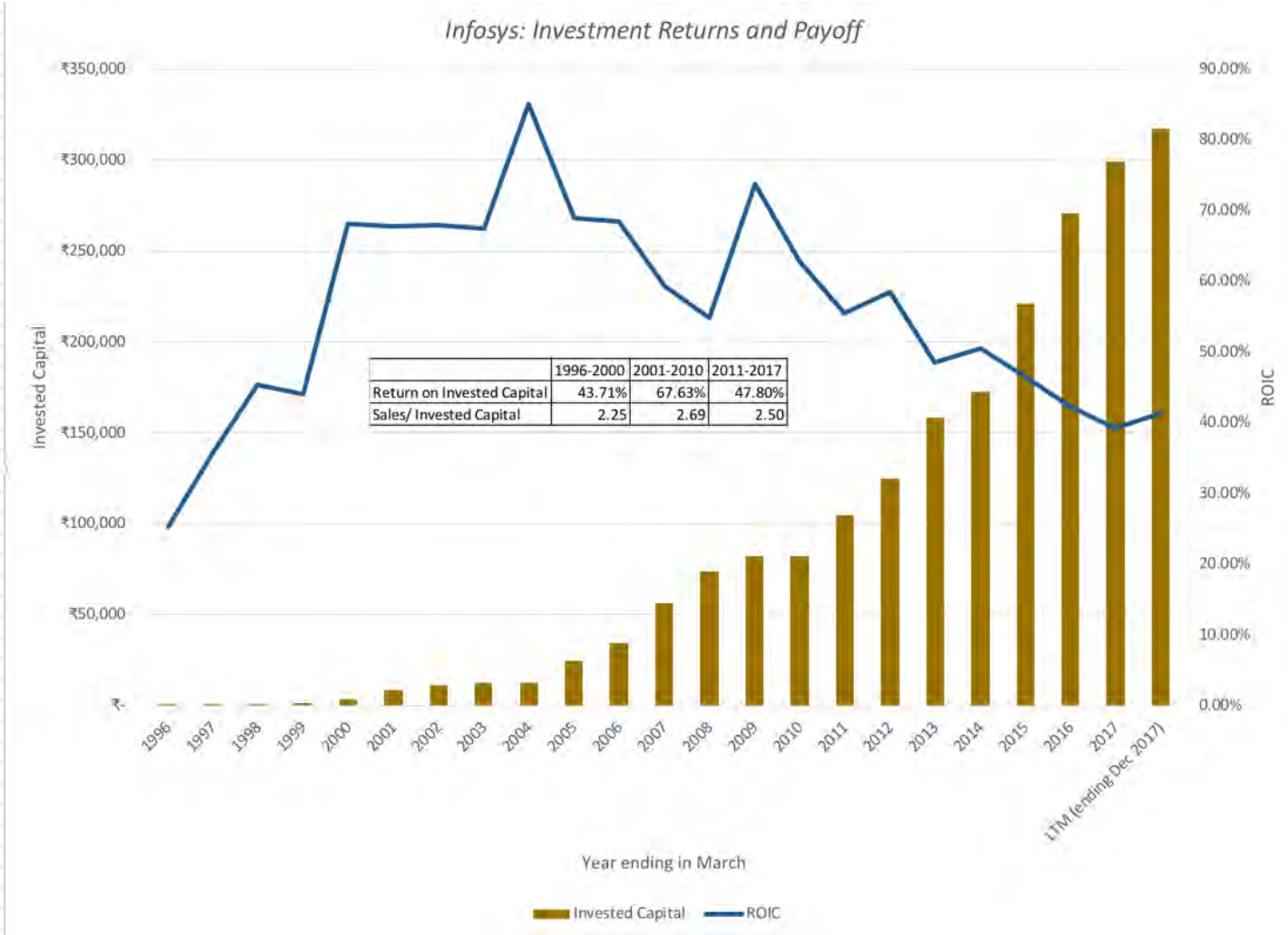


	ROIC less than WACC	ROIC close to WACC	ROIC greater than WACC
Africa and Middle East	51.68%	17.83%	30.49%
Australia & NZ	67.22%	8.06%	24.72%
Canada	80.31%	6.17%	13.52%
China	49.18%	16.54%	34.28%
EU & Environs	47.38%	16.21%	36.41%
Eastern Europe & Russia	50.96%	18.73%	30.30%
India	47.66%	14.85%	37.49%
Japan	34.24%	23.11%	42.65%
Latin America & Caribbean	43.90%	20.34%	35.76%
Small Asia	59.08%	15.12%	25.80%
UK	46.54%	13.46%	40.00%
United States	50.00%	11.73%	38.27%
Global	52.05%	15.32%	32.63%

Shell: Return on Invested Capital – The Macro Effect

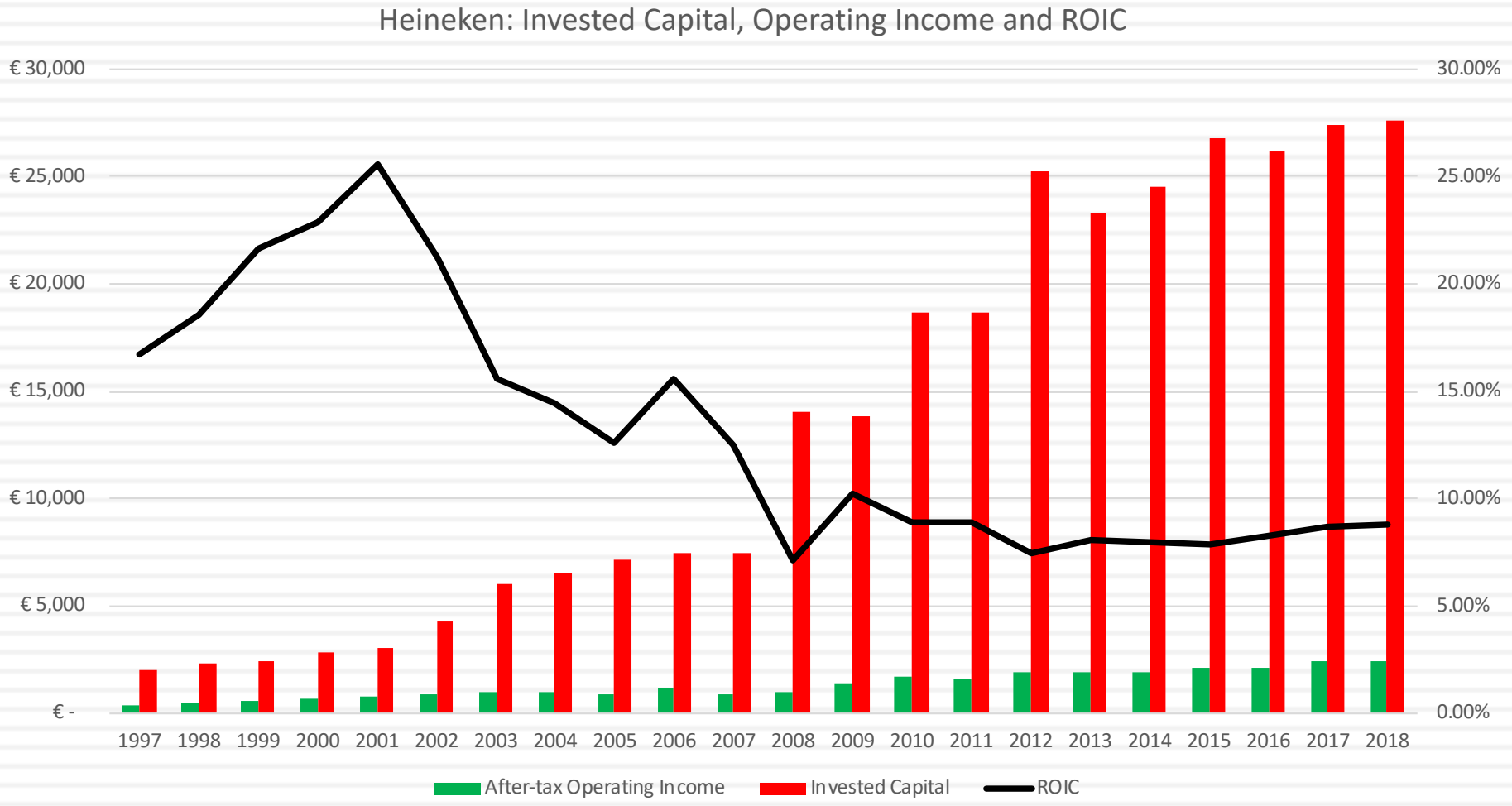


Infosys: Return on Invested Capital – Scaling up is hard to do…



	1996-2000	2001-2010	2011-2017
Return on Invested Capital	43.71%	67.63%	47.80%
Sales/ Invested Capital	2.25	2.69	2.50

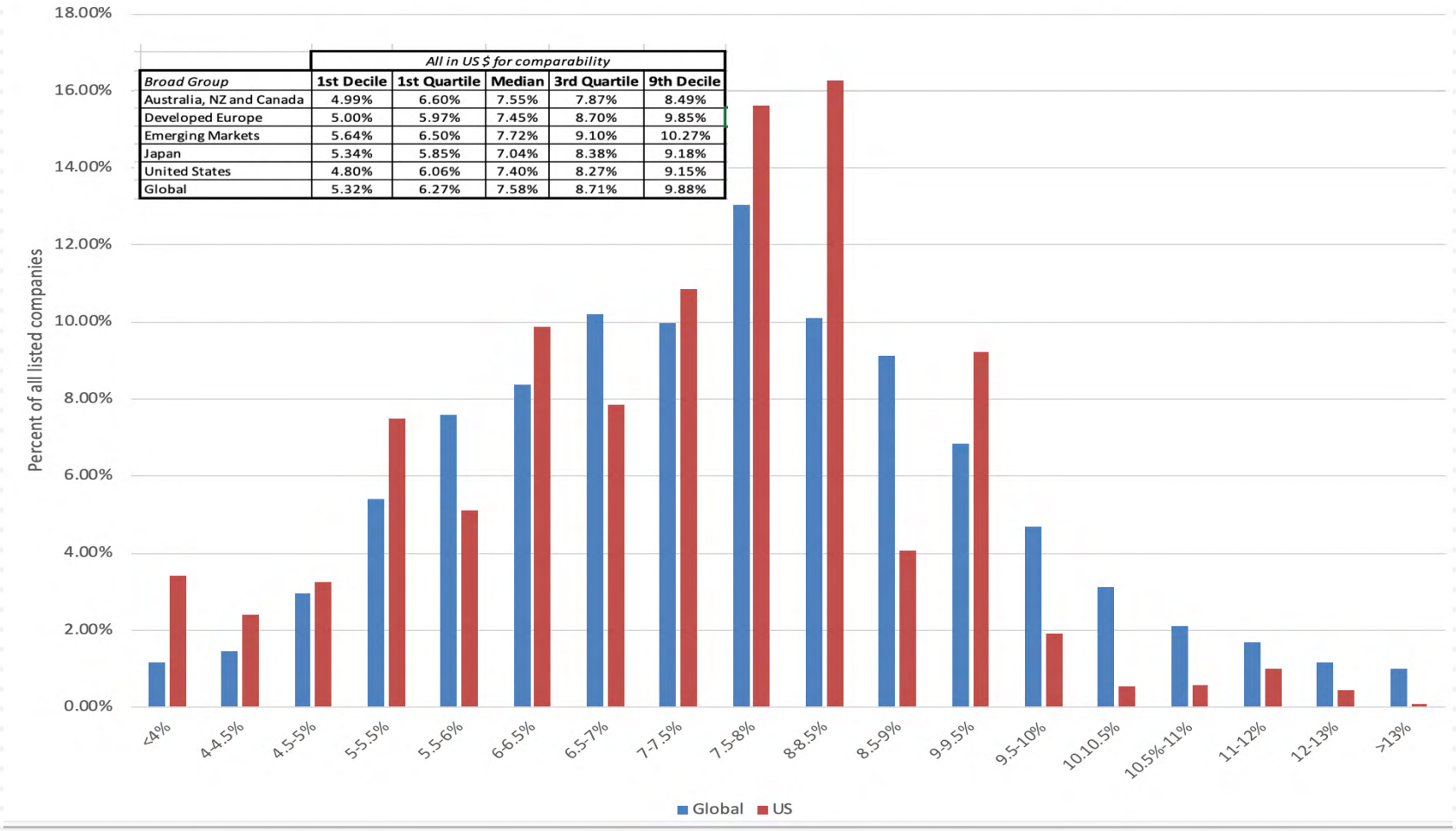
Heineken: Return on Invested Capital = Fading competitive advantages?



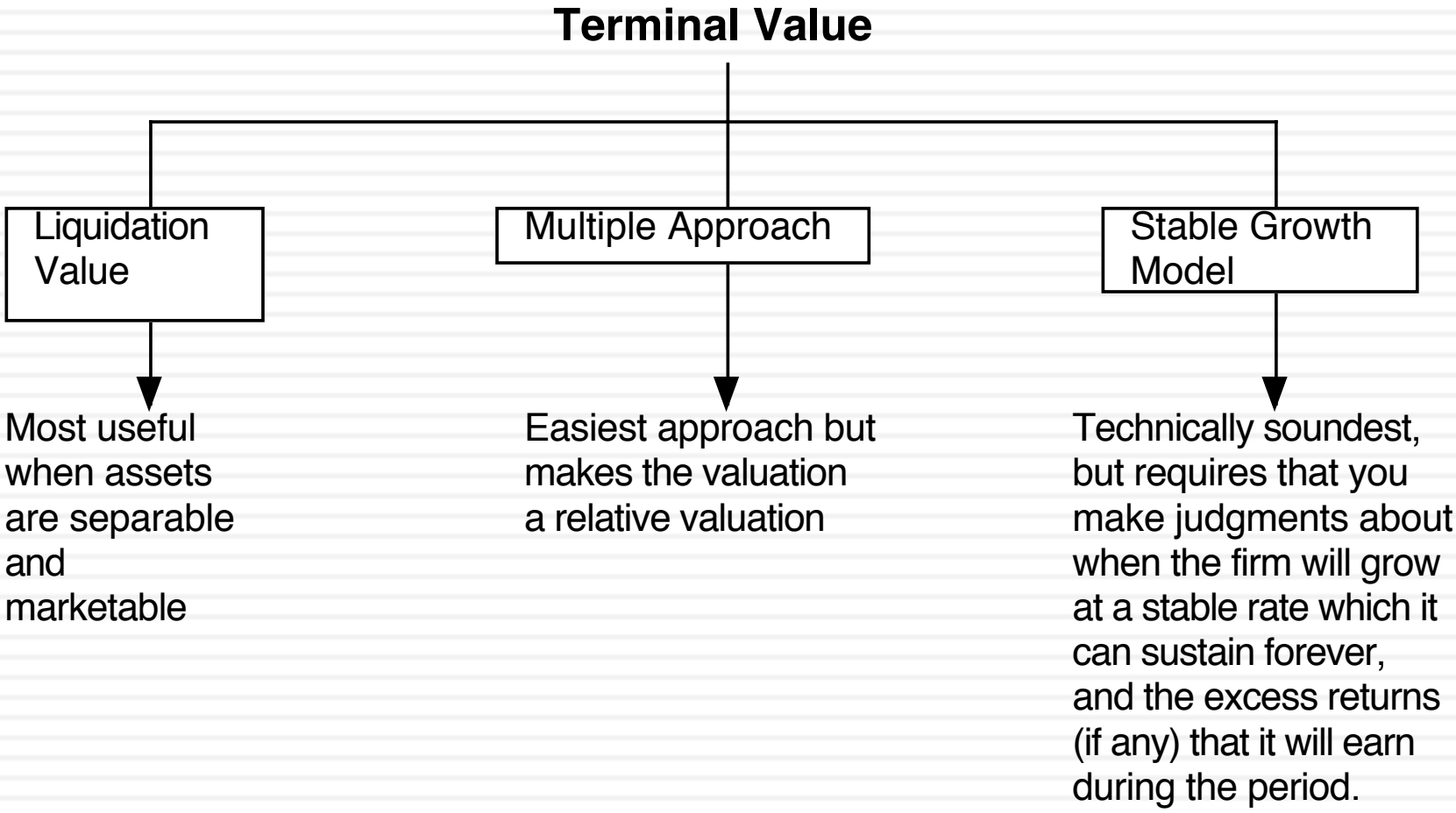
6. Don’t sweat the small stuff

Cost of Capital in January 2020: All Listed Non-financial Service Companies

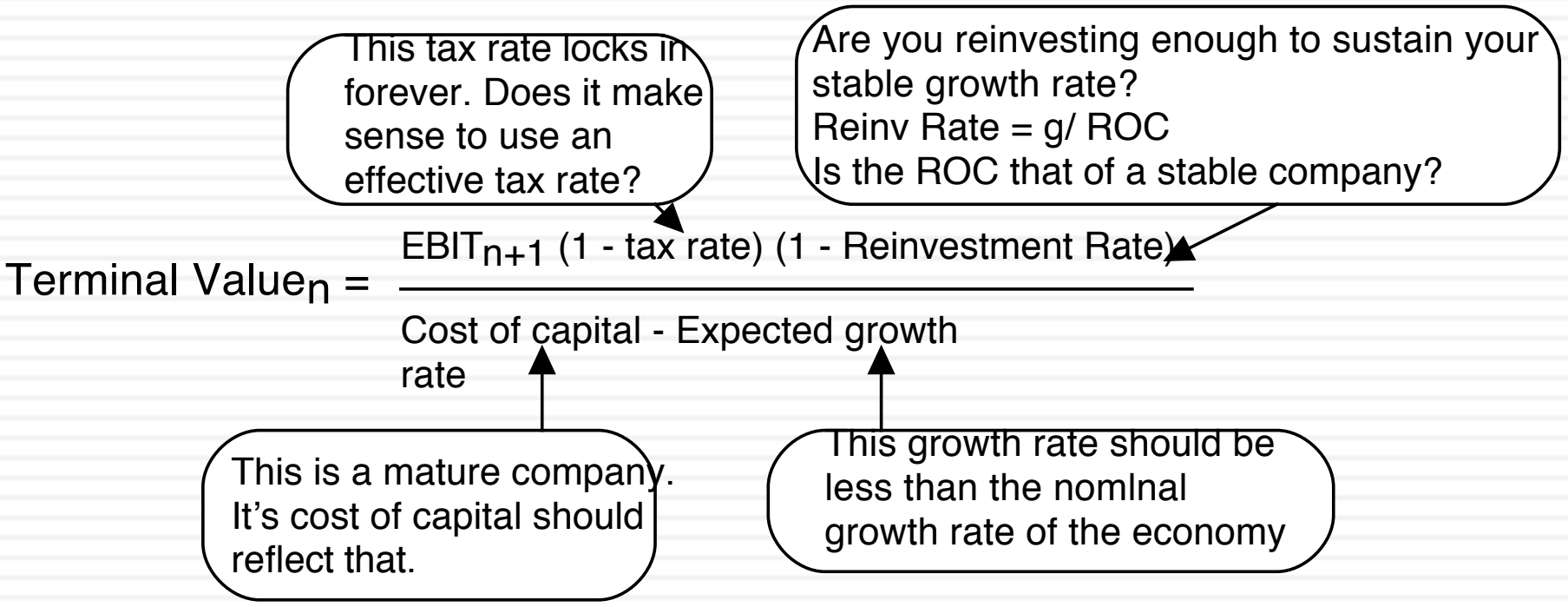
	All in US $ for comparability				
Broad Group	1st Decile	1st Quartile	Median	3rd Quartile	9th Decile
Australia, NZ and Canada	4.99%	6.60%	7.55%	7.87%	8.49%
Developed Europe	5.00%	5.97%	7.45%	8.70%	9.85%
Emerging Markets	5.64%	6.50%	7.72%	9.10%	10.27%
Japan	5.34%	5.85%	7.04%	8.38%	9.18%
United States	4.80%	6.06%	7.40%	8.27%	9.15%
Global	5.32%	6.27%	7.58%	8.71%	9.88%



7. The Terminal Value, more than just closure..



Don’t make it an ATM…



A. Obey the growth cap

- When a firm's cash flows grow at a "constant" rate forever, the present value of those cash flows can be written as:

  Value = Expected Cash Flow Next Period / (r - g)

  where,

  r = Discount rate (Cost of Equity or Cost of Capital)

  g = Expected growth rate

- The stable growth rate cannot exceed the growth rate of the economy but it can be set lower.
  - If you assume that the economy is composed of high growth and stable growth firms, the growth rate of the latter will probably be lower than the growth rate of the economy.
  - The stable growth rate can be negative. The terminal value will be lower and you are assuming that your firm will disappear over time.
  - If you use nominal cashflows and discount rates, the growth rate should be nominal in the currency in which the valuation is denominated.
- One simple proxy for the nominal growth rate of the economy is the riskfree rate.

Risk free Rates and Nominal GDP Growth

- **Risk free Rate** = Expected Inflation + Expected Real Interest Rate
- The real interest rate is what borrowers agree to return to lenders in real goods/services.

- **Nominal GDP Growth** = Expected Inflation + Expected Real Growth
- The real growth rate in the economy measures the expected growth in the production of goods and services.

The argument for Risk free rate = Nominal GDP growth

1. In the long term, the real growth rate cannot be lower than the real interest rate, since the growth in goods/services has to be enough to cover the promised rate.
2. In the long term, the real growth rate can be higher than the real interest rate, to compensate risk taking. However, as economies mature, the difference should get smaller and since there will be growth companies in the economy, it is prudent to assume that the extra growth comes from these companies.

Period	*10-Year T.Bond Rate*	*Inflation Rate*	*Real GDP Growth*	*Nominal GDP growth rate*	*Nominal GDP - T.Bond Rate*
1954-2015	5.93%	3.61%	3.06%	6.67%	0.74%
1954-1980	5.83%	4.49%	3.50%	7.98%	2.15%
1981-2008	6.88%	3.26%	3.04%	6.30%	-0.58%
2009-2015	2.57%	1.66%	1.47%	3.14%	0.57%

B. Don't wait too long…

- Assume that you are valuing a young, high growth firm with great potential, just after its initial public offering. How long would you set your high growth period?
  a. < 5 years
  b. 5 years
  c. 10 years
  d. >10 years
- While analysts routinely assume very long high growth periods (with substantial excess returns during the periods), the evidence suggests that they are much too optimistic. Most growth firms have difficulty sustaining their growth for long periods, especially while earning excess returns.

C. Do not forget that growth has to be earned..

- In the section on expected growth, we laid out the fundamental equation for growth:

  Growth rate = Reinvestment Rate * Return on invested capital

  + Growth rate from improved efficiency

- In stable growth, you cannot count on efficiency delivering growth and you have to reinvest to deliver the growth rate that you have forecast.
- Consequently, your reinvestment rate in stable growth will be a function of your stable growth rate and what you believe the firm will earn as a return on capital in perpetuity:
  - Reinvestment Rate = Stable growth rate/ Stable period ROC = g/ ROC
- Your terminal value equation can then be rewritten as:

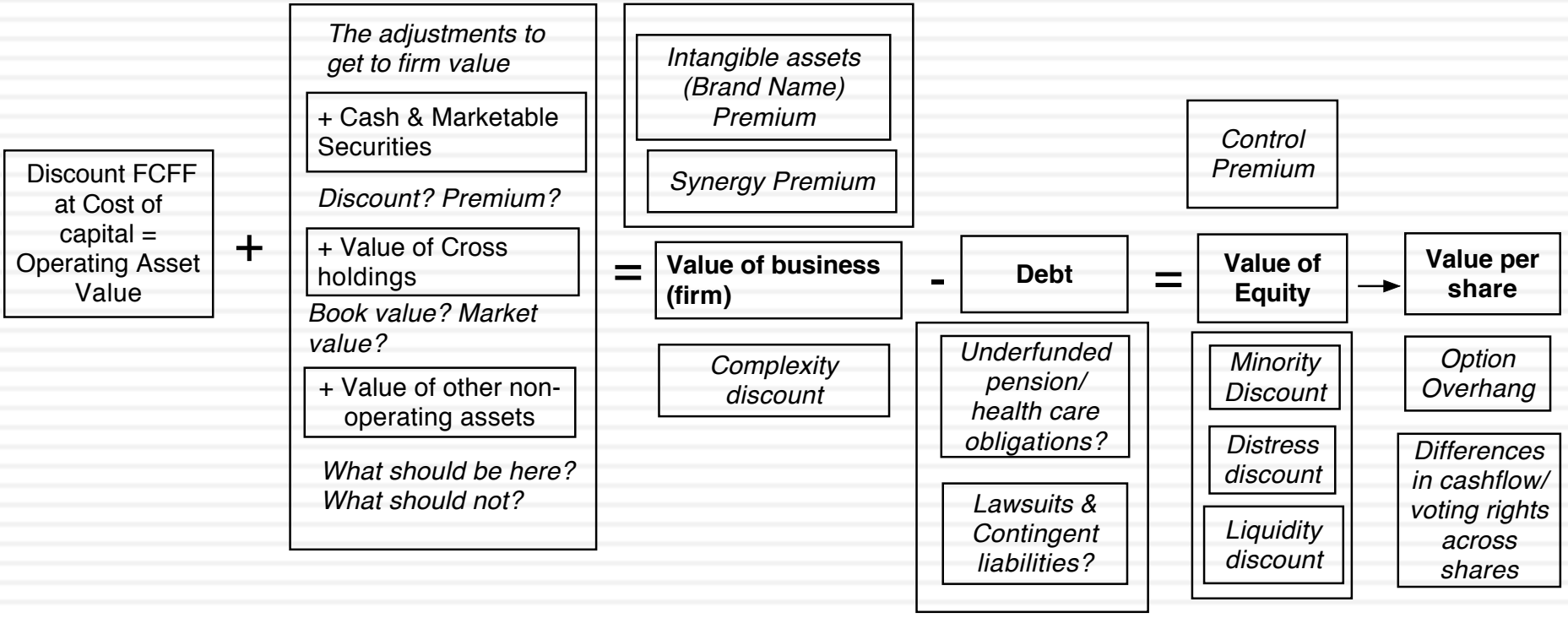
$$\text{Terminal Value in year n} = \frac{\text{EBIT}_{n+1}\ (1-t)(1-\frac{g}{ROC})}{(\text{Cost of Capital}-g)}$$

The Big Assumption

		Return on capital in perpetuity				
		6%	8%	10%	12%	14%
Growth rate forever	0.0%	$1,000	$1,000	$1,000	$1,000	$1,000
	0.5%	$965	$987	$1,000	$1,009	$1,015
	1.0%	$926	$972	$1,000	$1,019	$1,032
	1.5%	$882	$956	$1,000	$1,029	$1,050
	2.0%	$833	$938	$1,000	$1,042	$1,071
	2.5%	$778	$917	$1,000	$1,056	$1,095
	3.0%	$714	$893	$1,000	$1,071	$1,122

Terminal value for a firm with expected after-tax operating income of $100 million in year n+1 and a cost of capital of 10%.

8. Don't forget the loose ends…

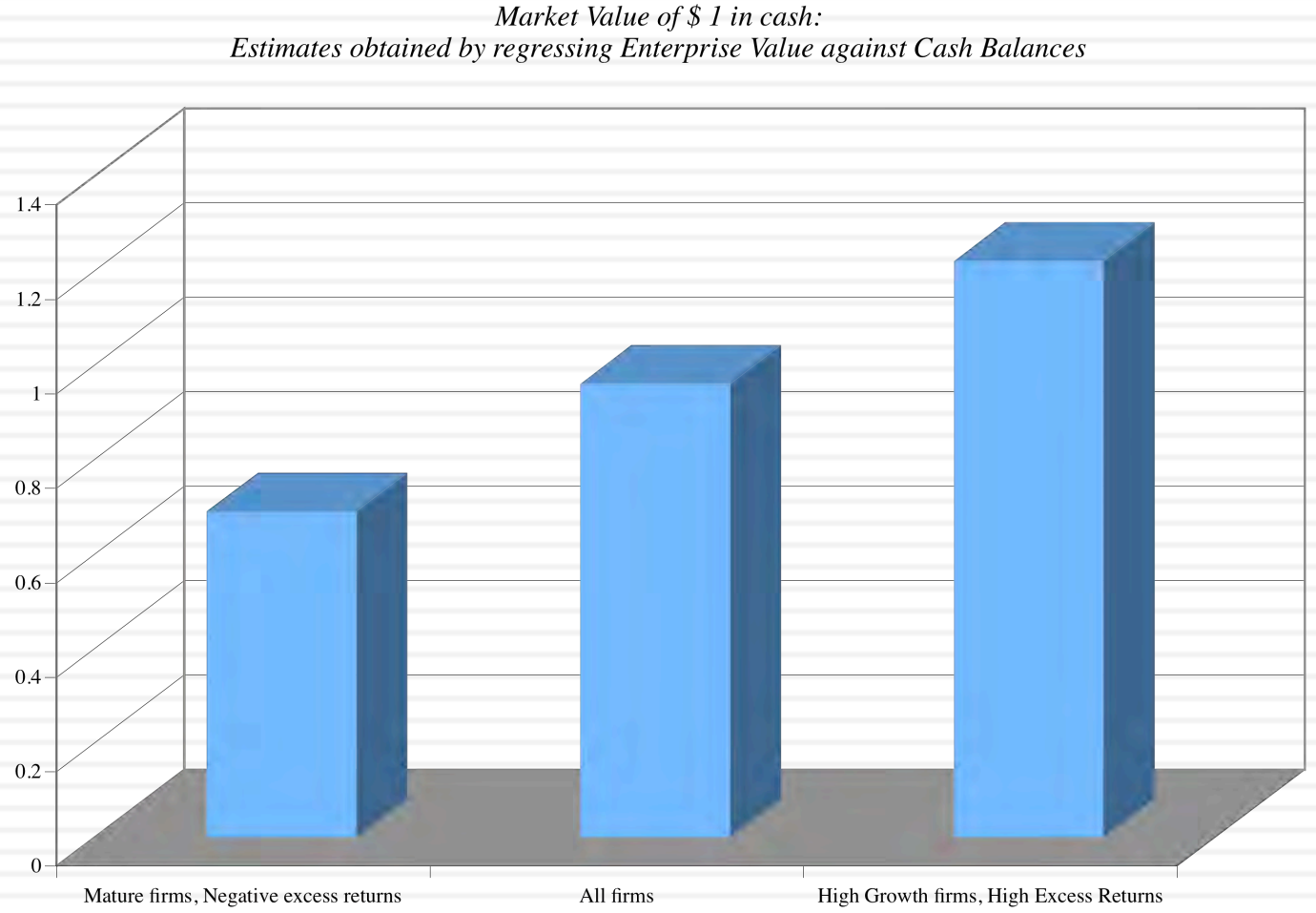


A. The Value of Cash
An Exercise in Cash Valuation

	Company A	Company B	Company C
Enterprise Value	$ 1 billion	$ 1 billion	$ 1 billion
Cash	$ 100 mil	$ 100 mil	$ 100 mil
Return on Capital	10%	5%	22%
Cost of Capital	10%	10%	12%
Trades in	US	US	Argentina

- In which of these companies is cash most likely to trade at face value, at a discount and at a premium?

Cash: Discount or Premium?



B. Dealing with Holdings in Other firms

- Holdings in other firms can be categorized into
  - Minority passive holdings, in which case only the dividend from the holdings is shown in the balance sheet
  - Minority active holdings, in which case the share of equity income is shown in the income statements
  - Majority active holdings, in which case the financial statements are consolidated.
- We tend to be sloppy in practice in dealing with cross holdings. After valuing the operating assets of a firm, using consolidated statements, it is common to add on the balance sheet value of minority holdings (which are in book value terms) and subtract out the minority interests (again in book value terms), representing the portion of the consolidated company that does not belong to the parent company.

How to value holdings in other firms.. In a perfect world..

- In a perfect world, we would strip the parent company from its subsidiaries and value each one separately. The value of the combined firm will be
  - Value of parent company + Proportion of value of each subsidiary
- To do this right, you will need to be provided detailed information on each subsidiary to estimate cash flows and discount rates.

Two compromise solutions…

- The market value solution: When the subsidiaries are publicly traded, you could use their traded market capitalizations to estimate the values of the cross holdings. You do risk carrying into your valuation any mistakes that the market may be making in valuation.
- The relative value solution: When there are too many cross holdings to value separately or when there is insufficient information provided on cross holdings, you can convert the book values of holdings that you have on the balance sheet (for both minority holdings and minority interests in majority holdings) by using the average price to book value ratio of the sector in which the subsidiaries operate.

C. Other Assets that have not been counted yet..

- Unutilized assets: If you have assets or property that are not being utilized (vacant land, for example), you have not valued it yet. You can assess a market value for these assets and add them on to the value of the firm.
- Overfunded pension plans: If you have a defined benefit plan and your assets exceed your expected liabilities, you could consider the over funding with two caveats:
  - Collective bargaining agreements may prevent you from laying claim to these excess assets.
  - There are tax consequences. Often, withdrawals from pension plans get taxed at much higher rates.
- **Do not double count an asset**. If you count the income from an asset in your cash flows, you cannot count the market value of the asset in your value.

The “real estate” play

- Assume that Severstal has real estate investments underlying its operations. Assume that you estimate a real estate value of $1.5 billion for the real estate. Can you add this value on to your DCF value?
  a. Yes.
  b. No.
  c. Depends
- What would you do if the value of the land exceeds the present value that you have estimated for them as operating assets?
  a. Nothing
  b. Use the higher of the two values
  c. Use the lower of the two values
  d. Use a weighted average of the two values

An Uncounted Asset?

Price tag: $200 million

The longtime home of Playboy magazine founder Hugh Hefner is to be sold to Daren Metropoulos, a principal at private-equity firm Metropoulos & Co. PHOTO: GETTY IMAGES

D. A Discount for Complexity: An Experiment

	Company A	Company B
Operating Income	$ 1 billion	$ 1 billion
Tax rate	40%	40%
ROIC	10%	10%
Expected Growth	5%	5%
Cost of capital	8%	8%
Business Mix	Single	Multiple Businesses
Holdings	Simple	Complex
Accounting	Transparent	Opaque

- Which firm would you value more highly?

Measuring Complexity: Volume of Data in Financial Statements

Company	*Number of pages in last 10Q*	*Number of pages in last 10K*
General Electric	65	410
Microsoft	63	218
Wal-mart	38	244
Exxon Mobil	86	332
Pfizer	171	460
Citigroup	252	1026
Intel	69	215
AIG	164	720
Johnson & Johnson	63	218
IBM	85	353

Measuring Complexity: A Complexity Score

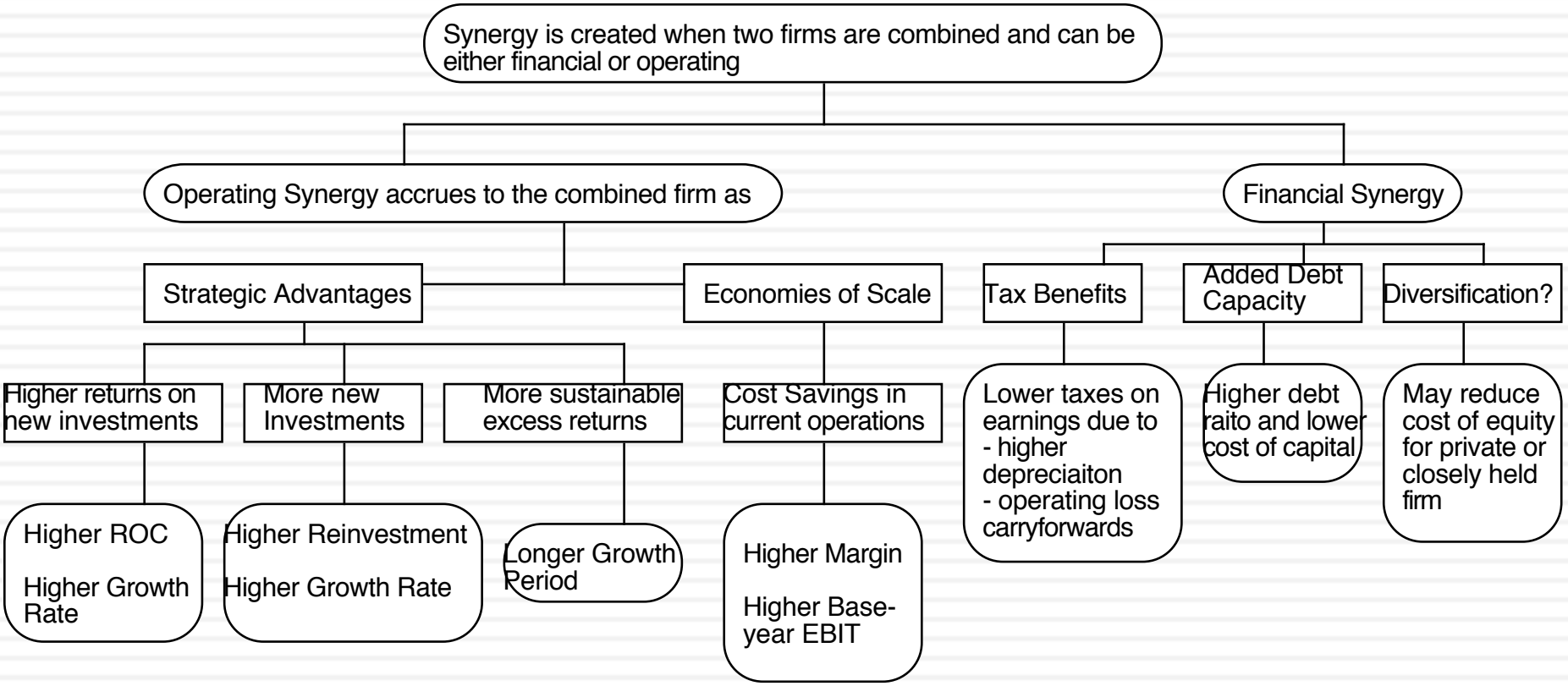
Item	Factors	Follow-up Question	Answer	Weighting factor	Gerdau Score	GE Score
Operating Income	1. Multiple Businesses	Number of businesses (with more than 10% of revenues) =	1	2.00	2	30
	2. One-time income and expenses	Percent of operating income =	10%	10.00	1	0.8
	3. Income from unspecified sources	Percent of operating income =	0%	10.00	0	1.2
	4. Items in income statement that are volatile	Percent of operating income =	15%	5.00	0.75	1
Tax Rate	1. Income from multiple locales	Percent of revenues from non-domestic locales =	70%	3.00	2.1	1.8
	2. Different tax and reporting books	Yes or No	No	Yes=3	0	3
	3. Headquarters in tax havens	Yes or No	No	Yes=3	0	0
	4. Volatile effective tax rate	Yes or No	Yes	Yes=2	2	0
Capital Expenditures	1. Volatile capital expenditures	Yes or No	Yes	Yes=2	2	2
	2. Frequent and large acquisitions	Yes or No	Yes	Yes=4	4	4
	3. Stock payment for acquisitions and investments	Yes or No	No	Yes=4	0	4
Working capital	1. Unspecified current assets and current liabilities	Yes or No	No	Yes=3	0	0
	2. Volatile working capital items	Yes or No	Yes	Yes=2	2	2
Expected Growth rate	1. Off-balance sheet assets and liabilities (operating leases and R&D)	Yes or No	No	Yes=3	0	3
	2. Substantial stock buybacks	Yes or No	No	Yes=3	0	3
	3. Changing return on capital over time	Is your return on capital volatile?	Yes	Yes=5	5	5
	4. Unsustainably high return	Is your firm's ROC much higher than industry average?	No	Yes=5	0	0
Cost of capital	1. Multiple businesses	Number of businesses (more than 10% of revenues) =	1	1.00	1	20
	2. Operations in emerging markets	Percent of revenues=	50%	5.00	2.5	2.5
	3. Is the debt market traded?	Yes or No	No	No=2	2	0
	4. Does the company have a rating?	Yes or No	Yes	No=2	0	0
	5. Does the company have off-balance sheet debt?	Yes or No	No	Yes=5	0	5
No-operating assets	Minority holdings as percent of book assets	Minority holdings as percent of book assets	0%	20.00	0	0.8
Firm to Equity value	Consolidation of subsidiaries	Minority interest as percent of book value of equity	63%	20.00	12.6	1.2
Per share value	Shares with different voting rights	Does the firm have shares with different voting rights?	Yes	Yes = 10	10	0
	Equity options outstanding	Options outstanding as percent of shares	0%	10.00	0	0.25
		Complexity Score =			48.95	90.55

Dealing with Complexity

- In Discounted Cashflow Valuation
  - The Aggressive Analyst: Trust the firm to tell the truth and value the firm based upon the firm's statements about their value.
  - The Conservative Analyst: Don't value what you cannot see.
  - The Compromise: Adjust the value for complexity
    - Adjust cash flows for complexity
    - Adjust the discount rate for complexity
    - Adjust the expected growth rate/ length of growth period
    - Value the firm and then discount value for complexity
- In relative valuation
  - In a relative valuation, you may be able to assess the price that the market is charging for complexity:
  - With the hundred largest market cap firms, for instance:

PBV = 0.65 + 15.31 ROE – 0.55 Beta + 3.04 Expected growth rate – 0.003 # Pages in 10K

E. The Value of Synergy



Valuing Synergy

(1) the firms involved in the merger are valued independently, by discounting expected cash flows to each firm at the weighted average cost of capital for that firm.

(2) the value of the combined firm, with no synergy, is obtained by adding the values obtained for each firm in the first step.

(3) The effects of synergy are built into expected growth rates and cashflows, and the combined firm is re-valued with synergy.

Value of Synergy = Value of the combined firm, with synergy - Value of the combined firm, without synergy

Inbev + SAB Miller: Where's the synergy?

	Inbev	*SABMiller*	*Combined firm (status quo)*	*Combined firm (synergy)*
Levered Beta	0.85	0.8289	0.84641	0.84641
Pre-tax cost of debt	3.0000%	3.2000%	3.00%	3.00%
Effective tax rate	18.00%	26.36%	19.92%	19.92%
Debt to Equity Ratio	30.51%	23.18%	29.71%	29.71%
Revenues	$45,762.00	$22,130.00	$67,892.00	$67,892.00
Operating Margin	32.28%	19.97%	28.27%	30.00%
Operating Income (EBIT)	$14,771.97	$4,419.36	$19,191.33	$20.368
After-tax return on capital	12.10%	12.64%	11.68%	12.00%
Reinvestment Rate =	50.99%	33.29%	43.58%	50.00%
Expected Growth Rate	6.17%	4.21%	5.09%	6.00%

The value of synergy

	Inbev	*SABMiller*	*Combined firm (status quo)*	*Combined firm (synergy)*
Cost of Equity =	8.93%	9.37%	9.12%	9.12%
After-tax cost of debt =	2.10%	2.24%	2.10%	2.10%
Cost of capital =	7.33%	8.03%	7.51%	7.51%
After-tax return on capital =	12.10%	12.64%	11.68%	12.00%
Reinvestment Rate =	50.99%	33.29%	43.58%	50.00%
Expected growth rate=	6.17%	4.21%	5.09%	6.00%
Value of firm				
PV of FCFF in high growth =	$28,733	$9,806	$38,539	$39,151
Terminal value =	$260,982	$58,736	$319,717	$340,175
Value of operating assets =	$211,953	$50,065	$262,018	$276,610

Value of synergy = 276,610 – 262,018 = 14,592 million

F. Brand name, great management, superb product …Are we short-changing intangibles?

- There is often a temptation to add on premiums for intangibles. Here are a few examples.
  - Brand name
  - Great management
  - Loyal workforce
  - Technological prowess
- There are two potential dangers:
  - For some assets, the value may already be in your value and adding a premium will be double counting.
  - For other assets, the value may be ignored but incorporating it will not be easy.

Valuing Brand Name

	Coca Cola	With Cott Margins
Current Revenues =	$21,962.00	$21,962.00
Length of high-growth period	10	10
Reinvestment Rate =	50%	50%
Operating Margin (after-tax)	15.57%	5.28%
Sales/Capital (Turnover ratio)	1.34	1.34
Return on capital (after-tax)	20.84%	7.06%
Growth rate during period (g) =	10.42%	3.53%
Cost of Capital during period =	7.65%	7.65%
Stable Growth Period		
Growth rate in steady state =	4.00%	4.00%
Return on capital =	7.65%	7.65%
Reinvestment Rate =	52.28%	52.28%
Cost of Capital =	7.65%	7.65%
Value of Firm =	$79,611.25	$15,371.24

Valuing a Franchise: Star Wars

	Add-on $ per Box Office $
Streaming/Video	$1.20
Toys & Merchandise	$2.00
Books/eBooks	$0.20
Gaming	$0.50
Other	$0.50

Add on $ per box office $

Star Wars Franchise Valuation: December 2015

Main Movies
World Box office of $1.5 billion, adjusted for 2% inflation.

Spin Off Movies
World Box office is 50% of main movies.

	Main Star Wars Movies			Star Wars Spin offs		
	Star Wars VII	Star Wars VIII	Star Wars IX	Rogue One	Hans Solo?	Boba Fett?
Years from now	0.0	2.0	4.0	1.0	3.0	5.0
Movies - Revenues	$2,000	$2,081	$2,165	$1,020	$1,061	$1,104
Streaming/Video - Revenues	$2,400	$2,497	$2,598	$1,224	$1,273	$1,325
Toys & Merchandise - Revenues	$4,000	$4,162	$4,330	$2,040	$2,122	$2,208
Books/eBooks - Revenues	$400	$416	$433	$204	$212	$221
Gaming - Revenues	$1,000	$1,040	$1,082	$510	$531	$552
Other - Revenues	$1,000	$1,040	$1,082	$510	$531	$552
Total - Revenues	$10,800	$11,236	$11,690	$5,508	$5,731	$5,962
After-tax Operating Income (movies)	$ 282	$ 293	$ 305	$ 144	$ 150	$ 156
After-tax Operating Income (non-movies)	$ 924	$ 961	$ 1,000	$ 471	$ 490	$ 510
Present Value	$ 1,206	$ 1,083	$ 973	$ 572	$ 514	$ 461

Operating Margin
20.14% for movies
15% for non-movies
30% tax rate

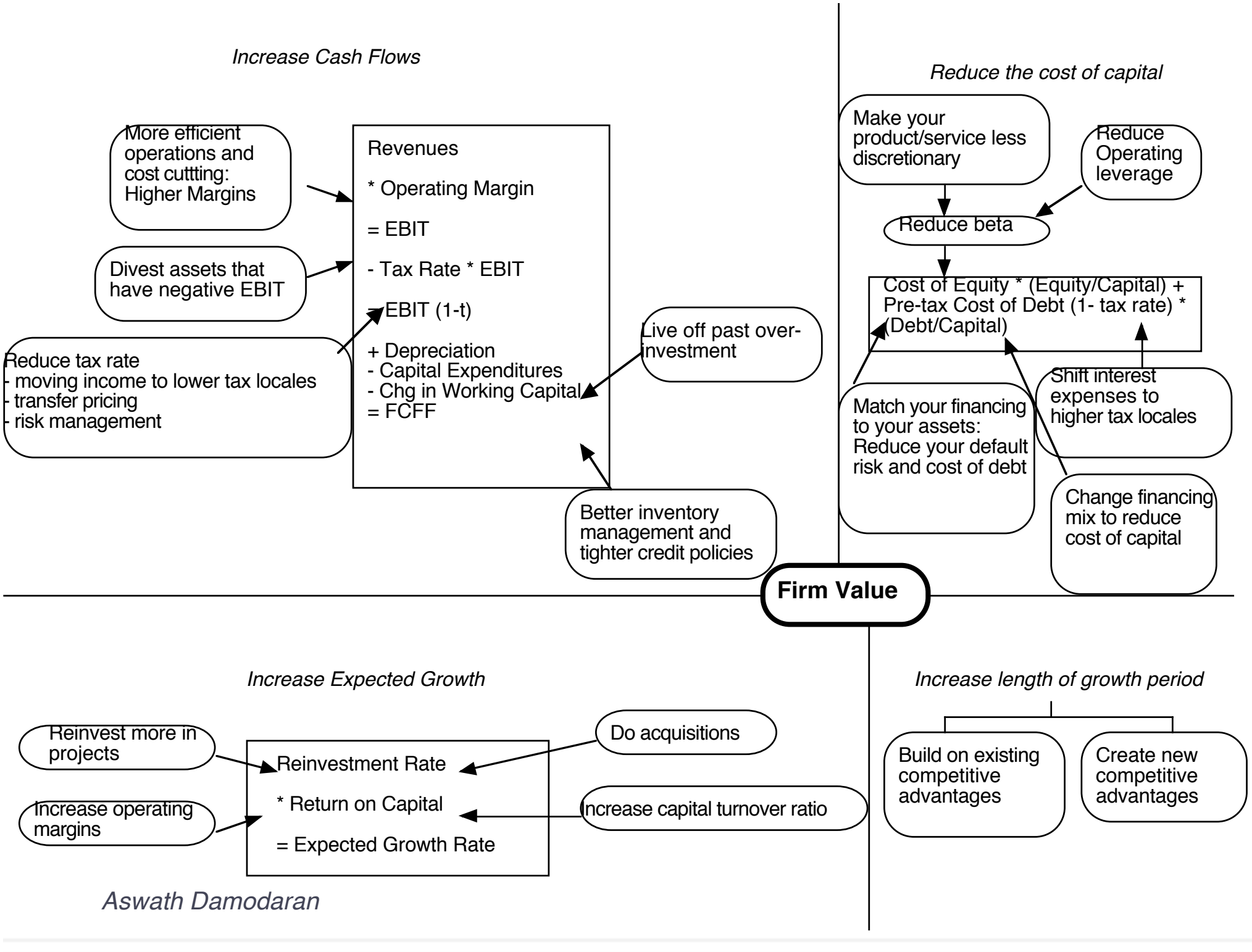
Discounted back @ 7.61% cost of capital of entertainment companies

Value of new Star Wars movies =	$4,809
Value of continuing income =	$5,163
Value of Star Wars =	$9,972

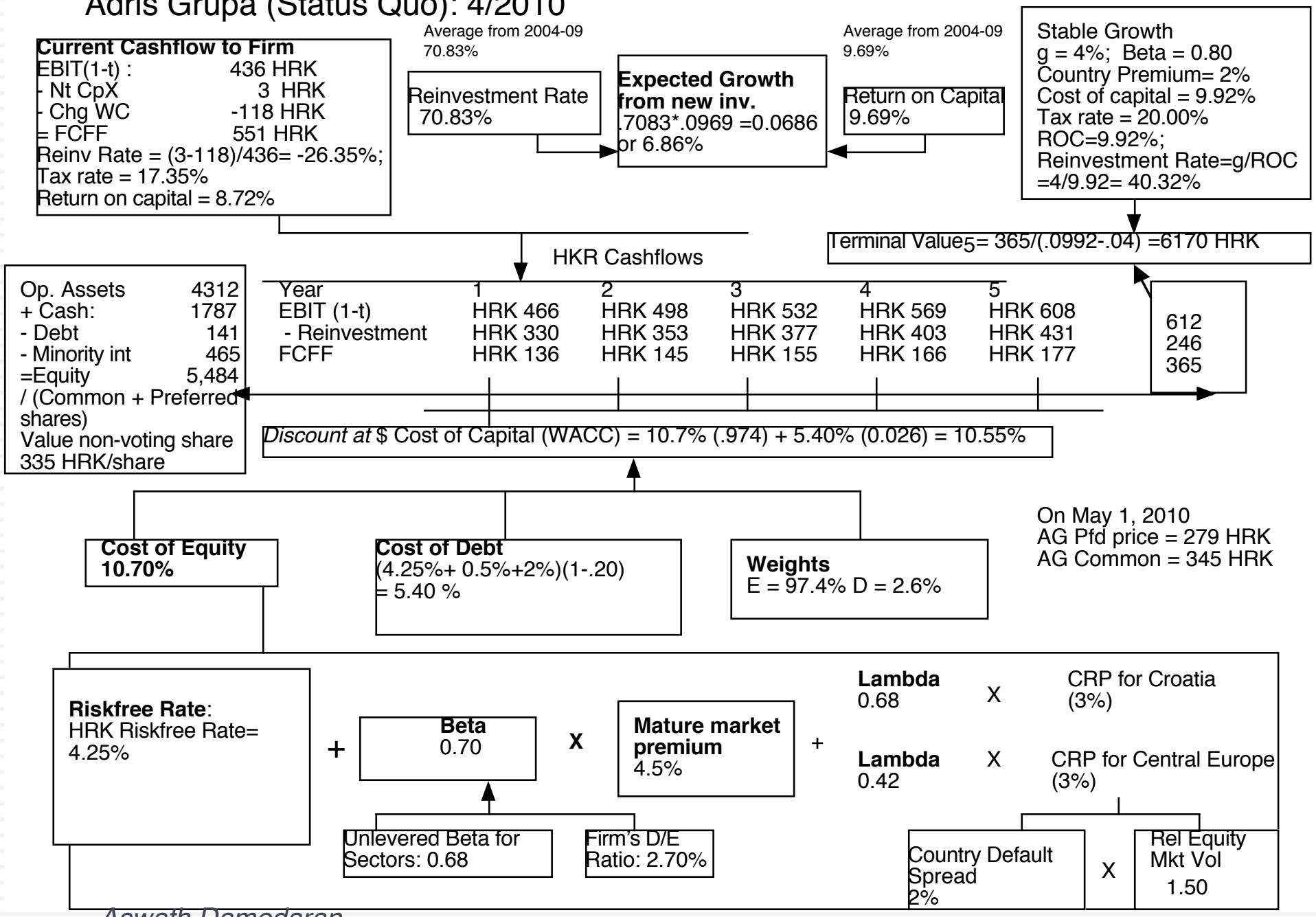
Assumes that revenues from add ons continue after 2020, growing at 2% a year, with 15% operating margin

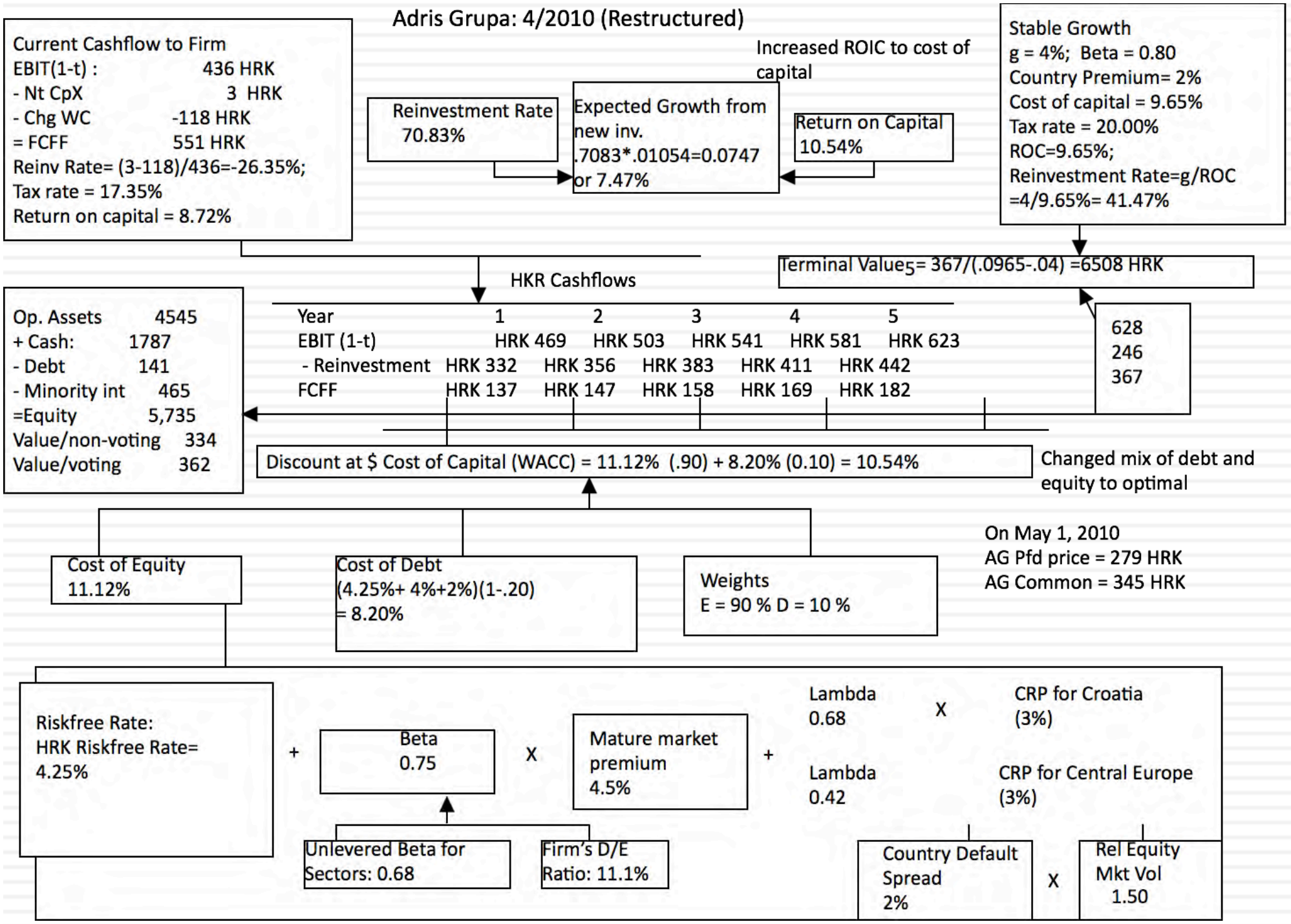
G. The Value of Control

- The value of the control premium that will be paid to acquire a block of equity will depend upon two factors -
  - Probability that control of firm will change: This refers to the probability that incumbent management will be replaced. this can be either through acquisition or through existing stockholders exercising their muscle.
  - Value of Gaining Control of the Company: The value of gaining control of a company arises from two sources - the increase in value that can be wrought by changes in the way the company is managed and run, and the side benefits and perquisites of being in control
  - Value of Gaining Control = Present Value (Value of Company with change in control - Value of company without change in control) + Side Benefits of Control


Increase Cash Flows
More efficient operations and cost cuttting: Higher Margins
Divest assets that have negative EBIT
Reduce tax rate
- moving income to lower tax locales
- transfer pricing
- risk management
Revenues
* Operating Margin
= EBIT
- Tax Rate * EBIT
= EBIT (1-t)
+ Depreciation
- Capital Expenditures
- Chg in Working Capital
= FCFF
Live off past over-investment
Better inventory management and tighter credit policies
Reduce the cost of capital
Make your product/service less discretionary
Reduce Operating leverage
Reduce beta
Cost of Equity * (Equity/Capital) + Pre-tax Cost of Debt (1- tax rate) * (Debt/Capital)
Match your financing to your assets: Reduce your default risk and cost of debt
Shift interest expenses to higher tax locales
Change financing mix to reduce cost of capital
Firm Value
Increase Expected Growth
Reinvest more in projects
Increase operating margins
Reinvestment Rate
* Return on Capital
= Expected Growth Rate
Do acquisitions
Increase capital turnover ratio
Increase length of growth period
Build on existing competitive advantages
Create new competitive advantages
Aswath Damodaran

Adris Grupa (Status Quo): 4/2010




Adris Grupa: 4/2010 (Restructured)
Current Cashflow to Firm
EBIT(1-t) : 436 HRK
- Nt CpX 3 HRK
- Chg WC -118 HRK
= FCFF 551 HRK
Reinv Rate= (3-118)/436=-26.35%;
Tax rate = 17.35%
Return on capital = 8.72%
Reinvestment Rate 70.83%
Expected Growth from new inv. .7083*.01054=0.0747 or 7.47%
Increased ROIC to cost of capital
Return on Capital 10.54%
Stable Growth
g = 4%; Beta = 0.80
Country Premium= 2%
Cost of capital = 9.65%
Tax rate = 20.00%
ROC=9.65%;
Reinvestment Rate=g/ROC =4/9.65%= 41.47%
Terminal Value5= 367/(.0965-.04) =6508 HRK
HKR Cashflows
Year 1 2 3 4 5
EBIT (1-t) HRK 469 HRK 503 HRK 541 HRK 581 HRK 623
- Reinvestment HRK 332 HRK 356 HRK 383 HRK 411 HRK 442
FCFF HRK 137 HRK 147 HRK 158 HRK 169 HRK 182
628
246
367
Op. Assets 4545
+ Cash: 1787
- Debt 141
- Minority int 465
=Equity 5,735
Value/non-voting 334
Value/voting 362
Discount at $ Cost of Capital (WACC) = 11.12% (.90) + 8.20% (0.10) = 10.54%
Changed mix of debt and equity to optimal
On May 1, 2010
AG Pfd price = 279 HRK
AG Common = 345 HRK
Cost of Equity 11.12%
Cost of Debt (4.25%+ 4%+2%)(1-.20) = 8.20%
Weights E = 90 % D = 10 %
Riskfree Rate: HRK Riskfree Rate= 4.25%
+
Beta 0.75
X
Mature market premium 4.5%
+
Lambda 0.68
X
CRP for Croatia (3%)
Lambda 0.42
CRP for Central Europe (3%)
Unlevered Beta for Sectors: 0.68
Firm's D/E Ratio: 11.1%
Country Default Spread 2%
X
Rel Equity Mkt Vol 1.50

Value of Control and the Value of Voting Rights

- Adris Grupa has two classes of shares outstanding: 9.616 million voting shares and 6.748 million non-voting shares.
- To value a non-voting share, we assume that all non-voting shares essentially have to settle for status quo value. All shareholders, common and preferred, get an equal share of the status quo value.

  Status Quo Value of Equity = 5,484 million HKR

  Value for a non-voting share = 5484/(9.616+6.748) = 334 HKR/share
- To value a voting share, we first value control in Adris Grup as the difference between the optimal and the status quo value:

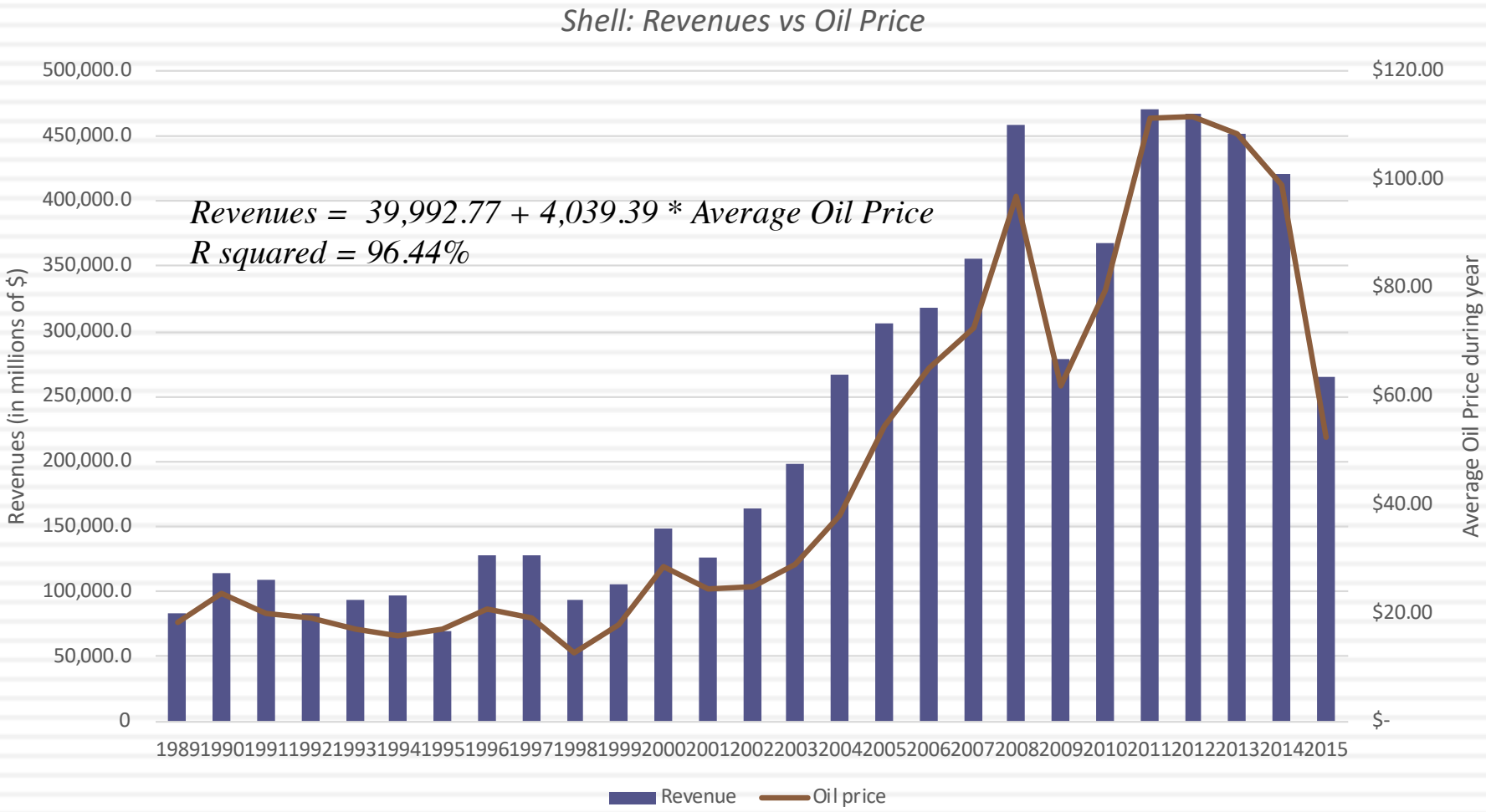
  Value of control at Adris Grupa = 5,735 – 5484 = 249 million HKR

  Value per voting share =334 HKR + 249/9.616 = 362 HKR

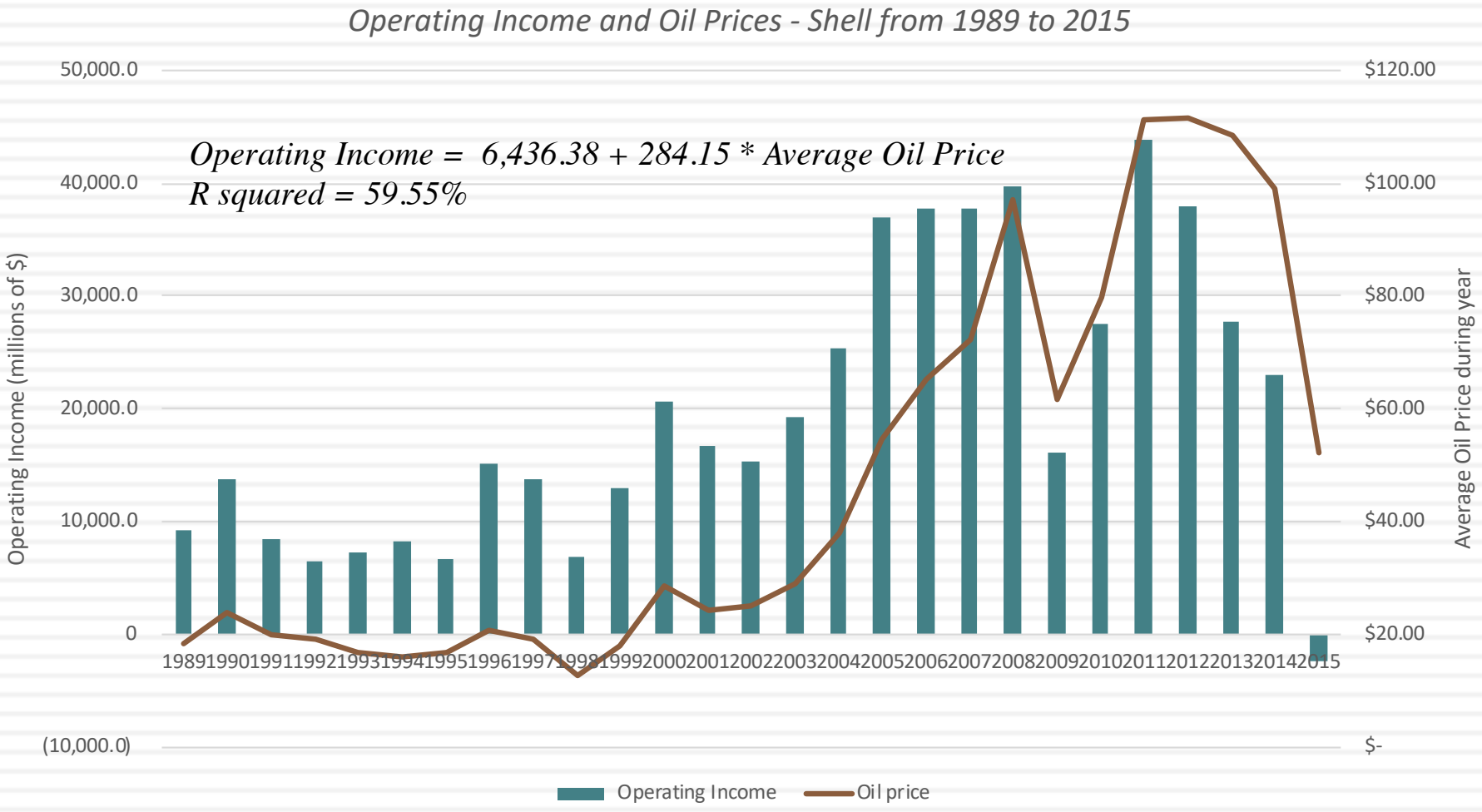
9. Don’t let your macro views drown out your micro views..

- 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.

The biggest driver for Shell (and no surprise) is..



Though they do have some power to alter your income..



Valuing Shell at April 2016 oil price ($40)

Revenue calculated from prevailing oil price of $40/barrel in March 2016
Revenue = 39992.77+4039.40*$40
= $201,569

Compounded revenue growth of 3.91% a year, based on Shell's historical revenue growth rate from 2000 to 2015

	Base Year	1	2	3	4	5	Terminal Year
Revenues	$ 201,569	$ 209,450	$ 217,639	$ 226,149	$ 234,991	$ 244,180	$ 249,063
Operating Margin	3.01%	6.18%	7.76%	8.56%	8.95%	9.35%	9.35%
Operating Income	$ 6,065.00	$ 12,942.85	$ 16,899.10	$ 19,352.39	$ 21,040.39	$ 22,830.80	$ 23,287.41
Effective tax rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
AT Operating Income	$ 4,245.50	$ 9,060.00	$ 11,829.37	$ 13,546.68	$ 14,728.27	$ 15,981.56	$ 16,301.19
+ Depreciation	$ 26,714.00	$ 27,759	$ 28,844	$ 29,972	$ 31,144	$ 32,361	
- Cap Ex	$ 31,854.00	$ 33,099	$ 34,394	$ 35,738	$ 37,136	$ 38,588	
- Chg in WC		$ 472.88	$ 491.37	$ 510.58	$ 530.55	$ 551.29	
FCFF		$ 3,246.14	$ 5,788.19	$ 7,269.29	$ 8,205.44	$ 9,203.68	$ 13,011.34
Terminal Value						$ 216,855.71	
Return on capital							12.37%
Cost of Capital		9.91%	9.91%	9.91%	9.91%	9.91%	8.00%
Cumulated Discount Factor		1.0991	1.2080	1.3277	1.4593	1.6039	
Present Value		$ 2,953.45	$ 4,791.47	$ 5,474.95	$ 5,622.81	$ 140,940.73	
Value of Operating Assets	$ 159,783.41						
+ Cash	$ 31,752.00						
+ Cross Holdings	$ 33,566.00						
- Debt	$ 58,379.00						
- Minority Interets	$ 1,245.00						
Value of Equity	$ 165,477.41						
Number of shares	4209.7						
Value per share	$ 39.31						

Added long term investments in joint ventures and subtracted out minority interest in consolidated holdings.

Operating margin converges on Shell's historical average margin of 9.35% from 200-2015

Return on capital reverts and stays at Shell's historic average of 12.37% from 200-2015

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	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	₹ 94,867
FCFF		₹ 92,887	₹ 101,407	₹ 110,702	₹ 120,841	₹ 131,902	₹ 146,747	₹ 161,927	₹ 177,198	₹ 192,289	₹ 206,905	₹ 169,632
Cost of capital		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	

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%**

Heineken: September 2019 (in Euros)

Cash flows from existing assets

	LTM	2013-2018
Revenues	€ 23,119	Growth rate = 3.22%
Operating Margin	14.86%	14.44%
Sales/Invested Capital	0.71	0.79
ROIC	7.46%	8.32%
Effective Tax Rate	29.70%	27.00%

The Payoff from growth

Revenues will grow 3.22% a year for next 5 years, tapering down to -0.5% growth in year 10

Operatng margin (per-tax) will drop to 14.00%

Sales/Invested Capital will stay at five-year average of 0.79.

Maturty and Closure

Stable Growth
g = -0.5%;
Cost of capital = 5%
ROC= 5%;
Reinvestment Rate=-.5%/5% = -10%

Terminal Value = 2972/(.05-..-(.005)) = 54,034

Euro Cashflows

	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate	3.22%	3.22%	3.22%	3.22%	3.22%	2.48%	1.73%	0.99%	0.24%	-0.50%	-0.50%
Revenues	€ 23,863	€ 24,632	€ 25,425	€ 26,244	€ 27,089	€ 27,759	€ 28,240	€ 28,519	€ 28,589	€ 28,446	€ 28,304
EBIT (Operating) margin	14.38%	14.34%	14.30%	14.26%	14.21%	14.17%	14.13%	14.09%	14.04%	14.00%	14.00%
EBIT (Operating income)	€ 3,432	€ 3,532	€ 3,635	€ 3,741	€ 3,850	€ 3,934	€ 3,990	€ 4,017	€ 4,015	€ 3,982	$ 3,963
Tax rate	29.70%	29.70%	29.70%	29.70%	29.70%	28.76%	27.82%	26.88%	25.94%	25.00%	$ 0
EBIT(1-t)	€ 2,413	€ 2,483	€ 2,556	€ 2,630	€ 2,707	€ 2,802	€ 2,880	€ 2,937	€ 2,973	€ 2,987	$ 2,972
- Reinvestment	€ 942	€ 973	€ 1,004	€ 1,036	€ 1,070	€ 849	€ 609	€ 353	€ 88	€ (181)	$ (297)
FCFF	€ 1,471	€ 1,511	€ 1,552	€ 1,594	€ 1,637	€ 1,953	€ 2,271	€ 2,584	€ 2,885	€ 3,168	$ 3,269

PV(Terminal value)	€ 36,390.85
PV (CF over next 10 years)	€ 15,300.34
Value of operating assets =	€ 51,691.19
- Debt	€ 19,709.52
- Minority interests	€ 1,069.00
+ Cash	€ 1,751.60
+ Non-operating assets	€ 1,401.00
Value of equity	€ 34,065.26
Number of shares	571.10
Estimated value /share	€ 59.65
Price	€ 93.25
Price as % of value	56.33%

Discount at Euro Cost of Capital (WACC) = 7.66% (.599) + 1.13% (0.401) = 5.04%

The Risk in the Cash flows

On September 1, 2019, Heineken was trading at 93.25 Euros/share

Cost of Equity 7.66%

Cost of Debt (-0.5%+2%)(1-.25) = 1.13%

Weights E = 59.9% D = 40.1%

Riskfree Rate: Euro Risk free rate = -0.50%

\+

Beta = 1.20

X

Firm's D/E Ratio: 66.98%

Unlevered beta of alcoholic beverage business = 0.80

ERP = 6.83%			
Region	*Revenues*	*Weight*	*ERP*
Europe	10348	50.24%	6.90%
North America	5920	28.74%	5.75%
Asia	2919	14.17%	7.22%
Latin America & Caribbean	781	3.79%	10.53%
Africa & Mid East	631	3.06%	9.30%
Total	**20599**	**100.00%**	**6.83%**

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

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.

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).

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 ≠ DCF

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

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

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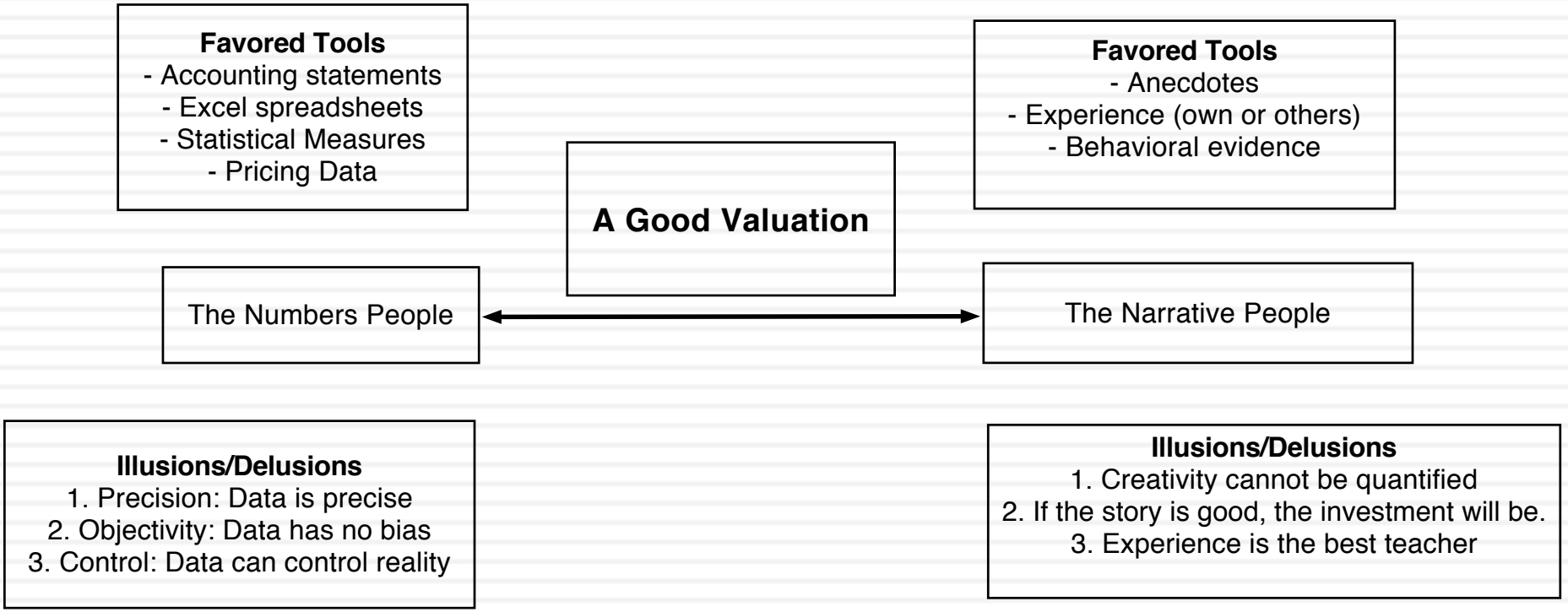
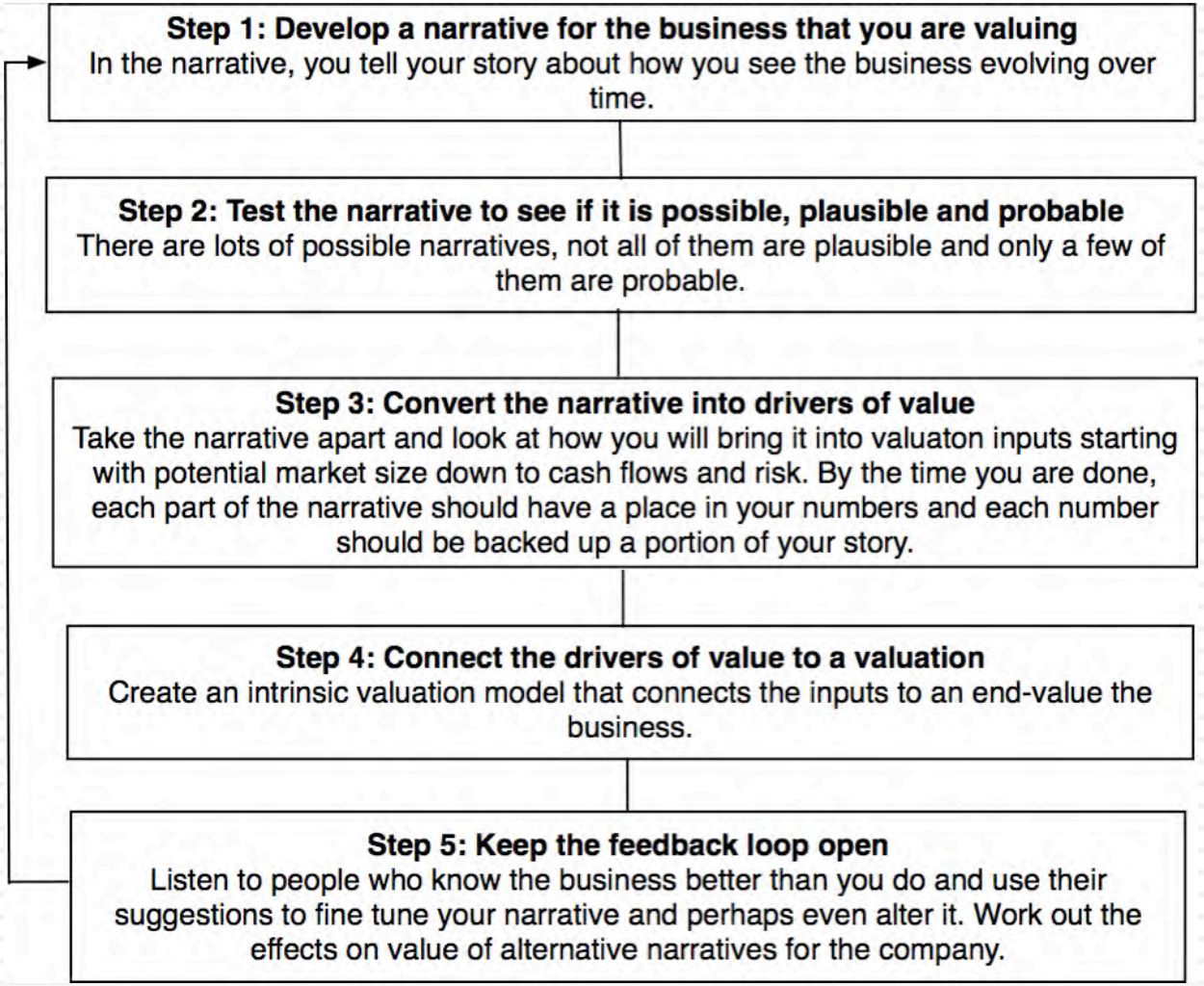
III. Story + Numbers = Value

Don’t mistake modeling for valuation



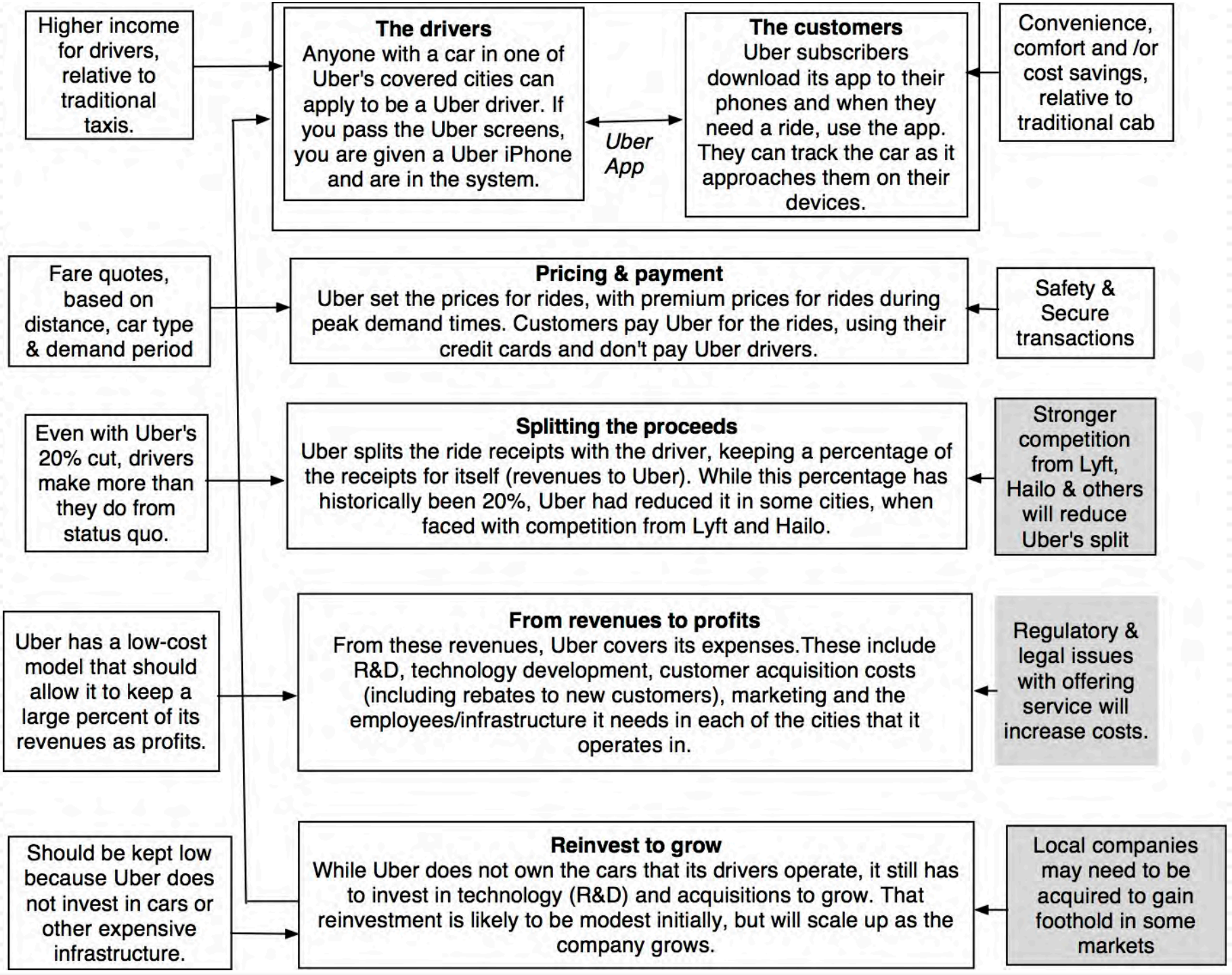
The Steps


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

Step 1a: Survey the landscape

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

Understanding Uber in 2014



Understanding Ferrari in 2015

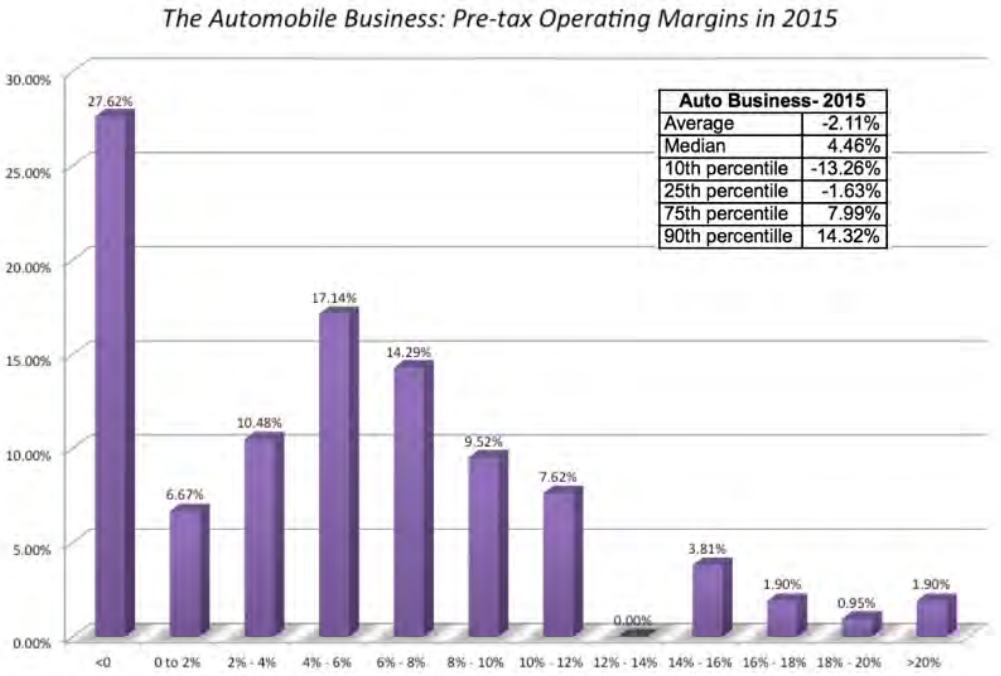
It is in the Auto Business

Low Growth

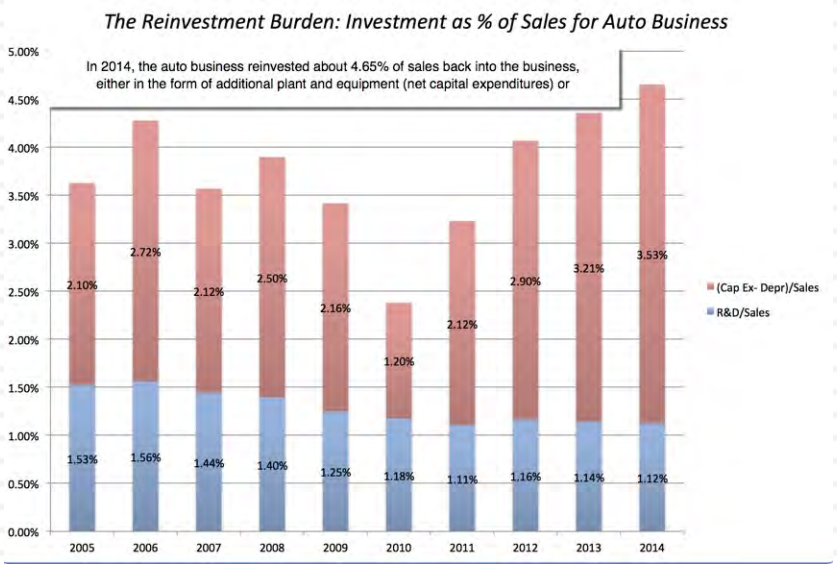
Year	Revenues ($)	% Growth Rate
2005	1,274,716.60	
2006	1,421,804.20	11.54%
2007	1,854,576.40	30.44%
2008	1,818,533.00	-1.94%
2009	1,572,890.10	-13.51%
2010	1,816,269.40	15.47%
2011	1,962,630.40	8.06%
2012	2,110,572.20	7.54%
2013	2,158,603.00	2.28%
2014	2,086,124.80	-3.36%
ounded Average =		5.63%

+

Low Margins



High & Increasing Reinvestment



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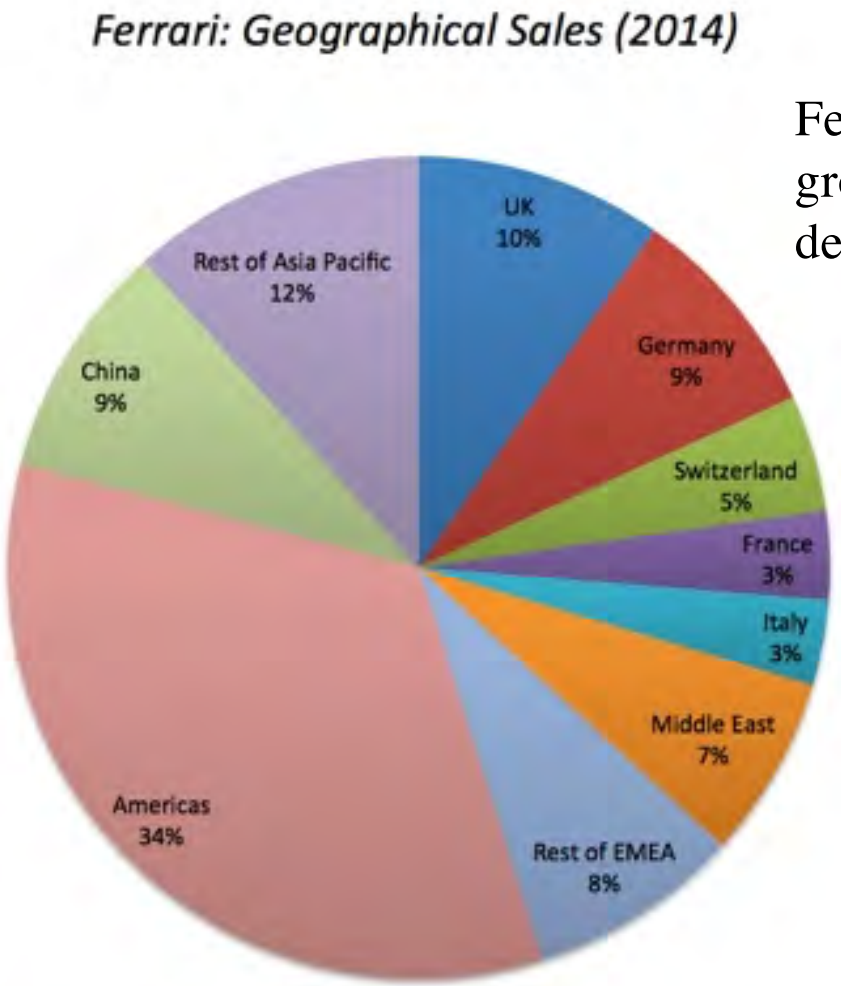
Bad Business

	ROIC	Cost of capital	ROiC - Cost of capital
2004	6.82%	7.93%	-1.11%
2005	10.47%	7.02%	3.45%
2006	4.60%	7.97%	-3.37%
2007	7.62%	8.50%	-0.88%
2008	3.48%	8.03%	-4.55%
2009	-4.97%	8.58%	-13.55%
2010	5.16%	8.03%	-2.87%
2011	7.55%	8.15%	-0.60%
2012	7.80%	8.55%	-0.75%
2013	7.83%	8.47%	-0.64%
2014	6.47%	7.53%	-1.06%

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

But it is not just another auto company..

Ferrari sold only 7,255 cars in all of 2014



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

Ferrari had a profit margin of 18.2%, in the 95th percentile, partly because of its high prices and partly because it spends little on advertising.

Ferrari has not invested in new plants.

Step 1b: Create a narrative for the future

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

The Uber Narrative: An Urban, Car Service disruptor

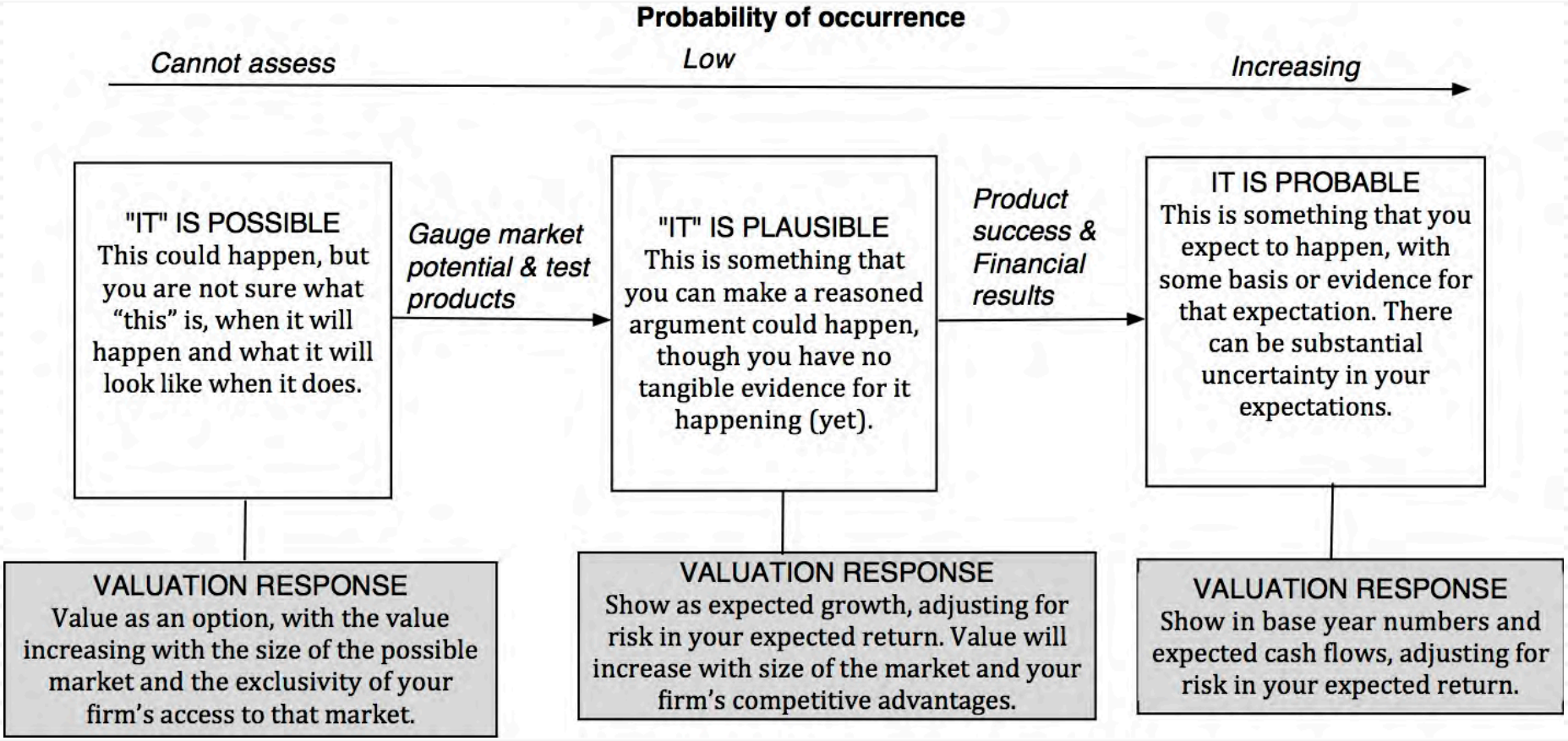
In June 2014, my initial narrative for Uber was that it would be

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

The Ferrari Narrative: An Exclusive Club

- Ferrari will stay an exclusive auto club, deriving its allure from its scarcity and the fact that only a few own Ferraris.
- By staying exclusive, the company gets three benefits:
  - It can continue to charge nose bleed prices for its cars and sell them with little or no advertising.
  - It does not need to invest in new assembly plants, since it does not plan to ramp up production.
  - It sells only to the super rich, who are unaffected by overall economic conditions or market crises.

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



The Impossible, The Implausible and the Improbable

The Impossible

Bigger than the economy
Assuming Growth rate for company in perpetuity> Growth rate for economy

Bigger than the total market
Allowing a company's revenues to grow so much that it has more than a 100% market share of whatever business it is in.

Profit margin > 100%
Assuming earnings growth will exceeds revenue growth for a long enough period, and pushing margins above 100%

Depreciation without cap ex
Assuming that depreciation will exceed cap ex in perpetuity.

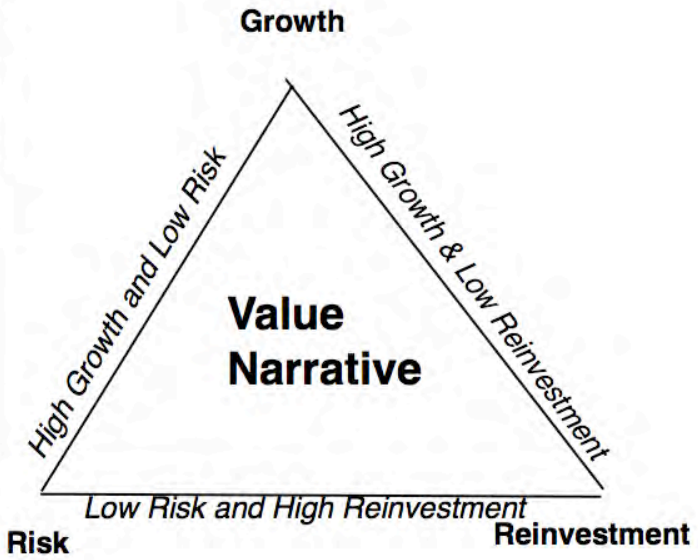
The Implausible

Growth without reinvestment
Assuming growth forever without reinvestment.

Profits without competition
Assuming that your company will grow and earn higher profits, with no competition.

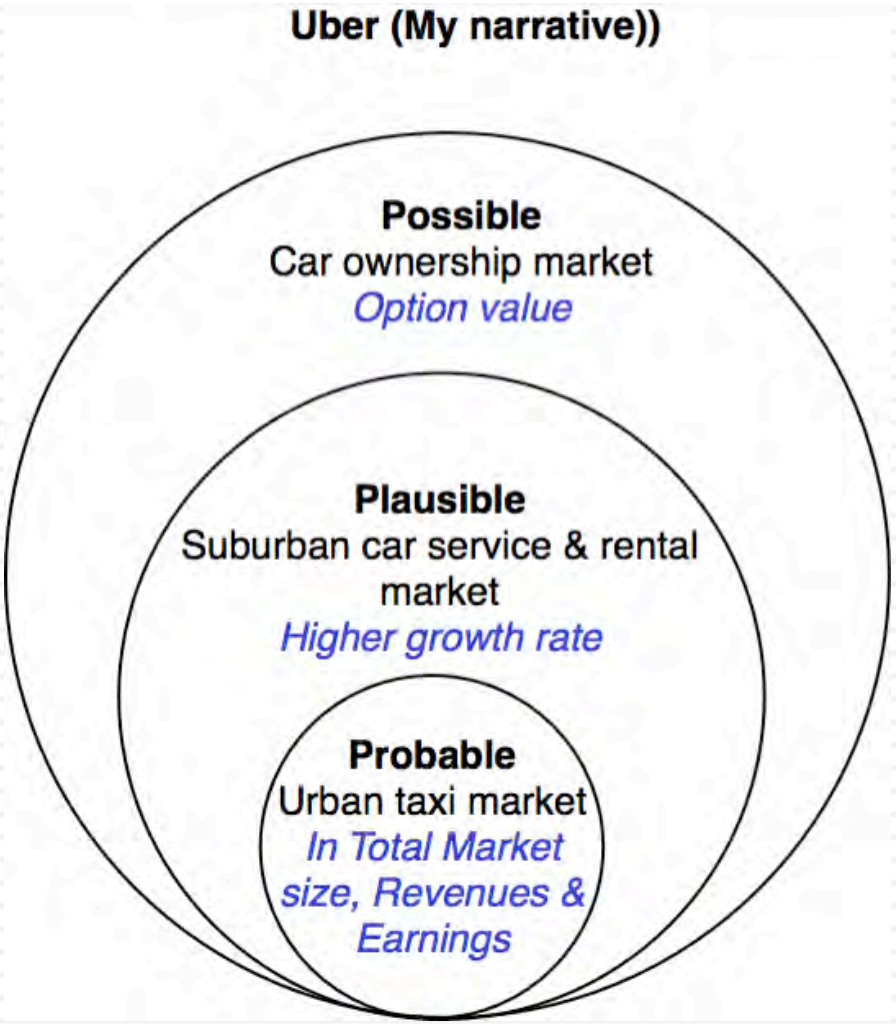
Returns without risk
Assuming that you can generate high returns in a business with no risk.

The Improbable



Uber: Possible, Plausible and Probable

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

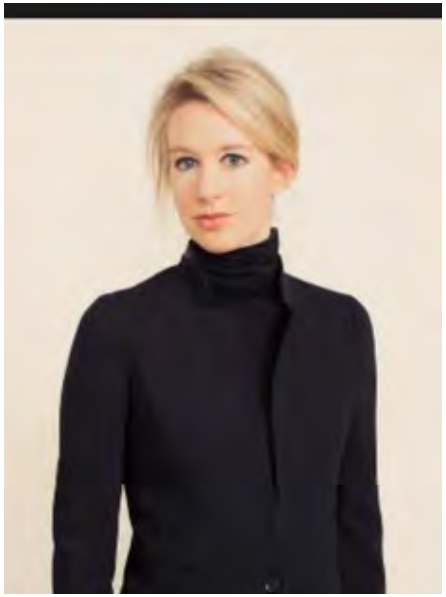


The Runaway Story: When you want a story to be true…

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

The Impossible: The Runaway Story

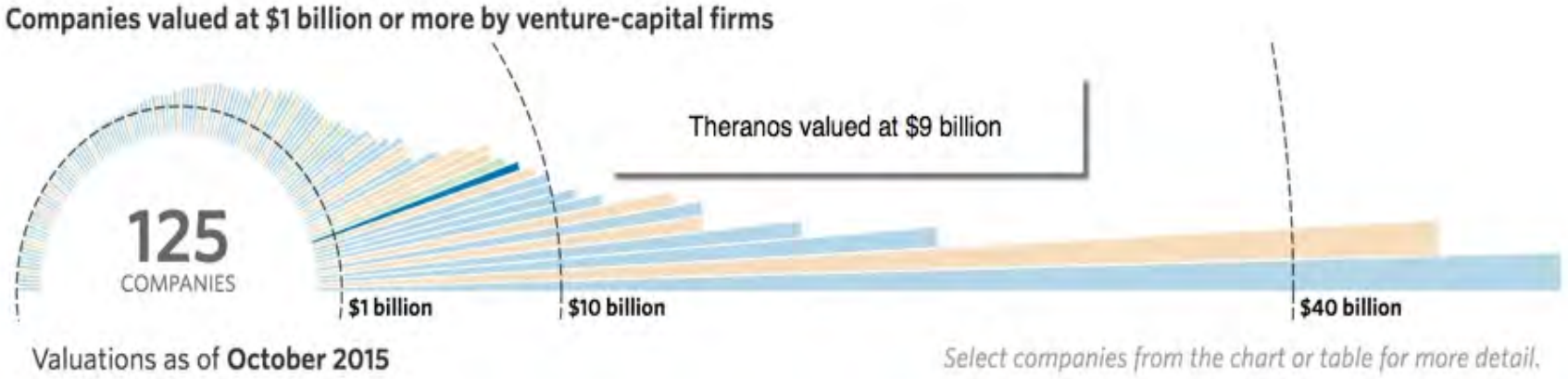
The Story



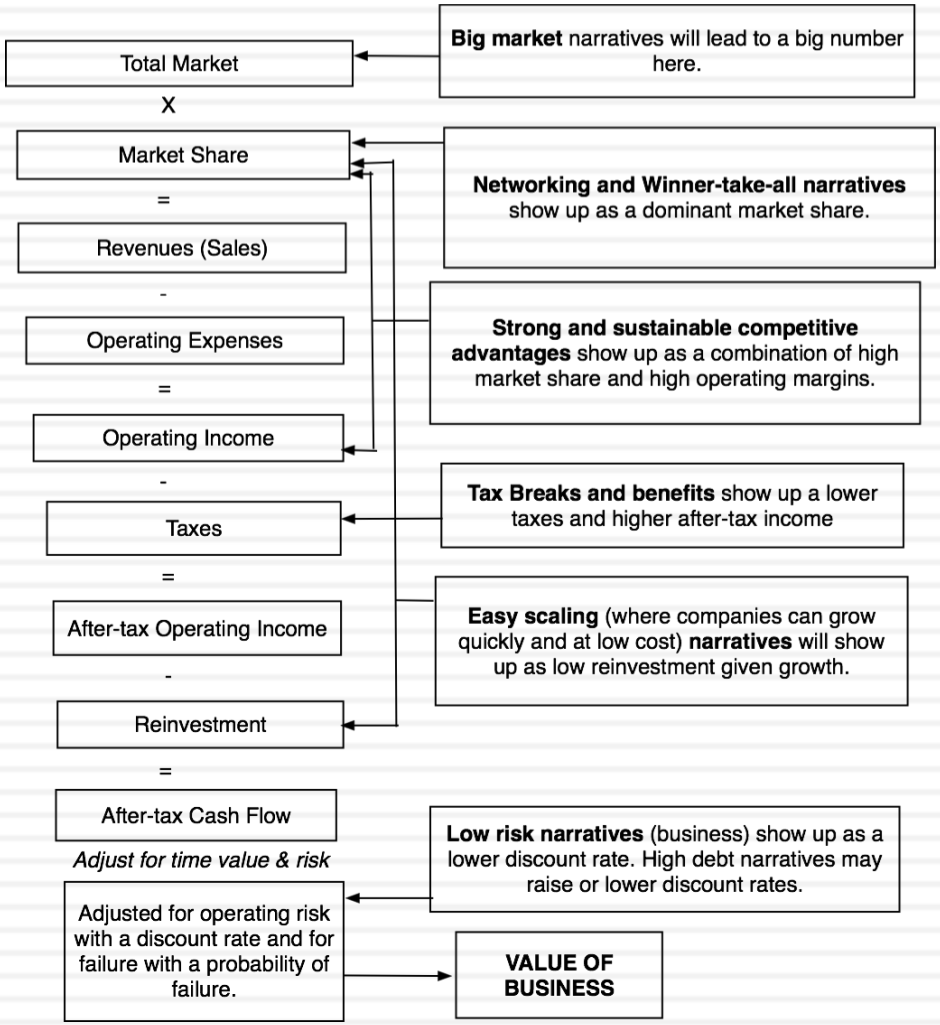
The Checks (?)

Board Member	Designation	Age
Henry Kissinger	Former Secretary of State	92
Bill Perry	Former Secretary of Defense	88
George Schultz	Former Secretary of State	94
Bill Frist	Former Senate Majority Leader	63
Sam Nunn	Former Senator	77
Gary Roughead	Former Navy Admiral	64
James Mattis	Former Marine Corps General	65
Dick Kovocovich	Former CEO of Wells Fargo	72
Riley Bechtel	Former CEO of Bechtel	63
William Foege	Epidemologist	79
Elizabeth Holmes	Founder & CEO, Theranos	31
Sunny Balwani	President & COO, Theranos	NA

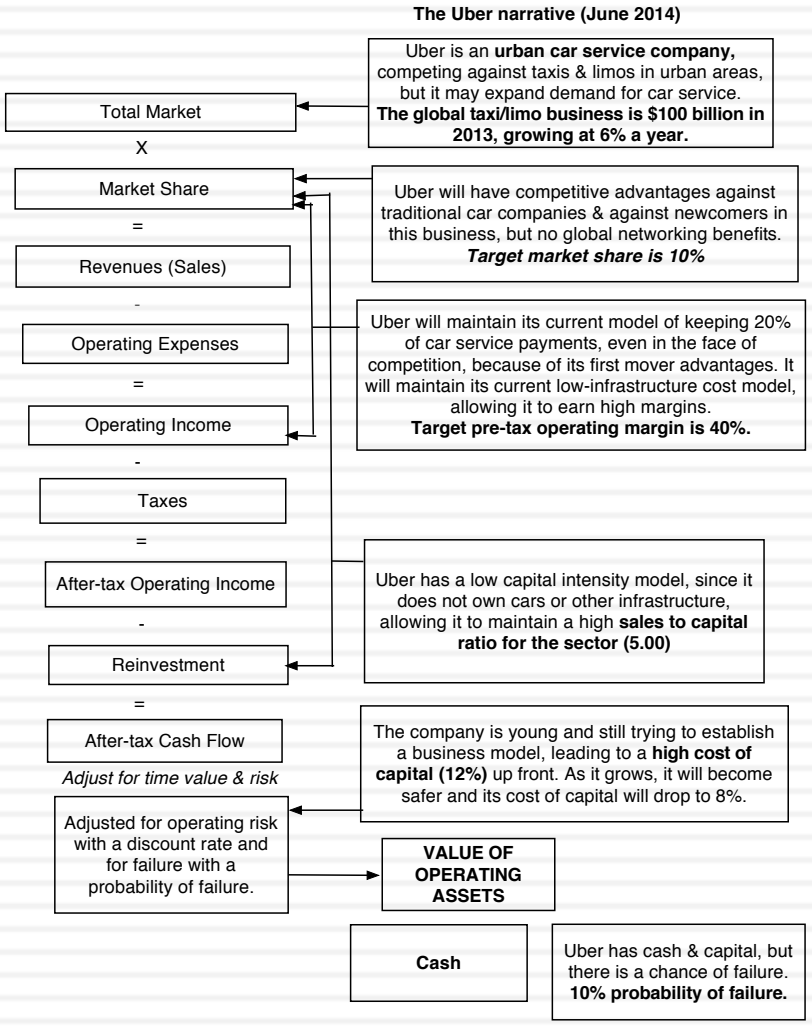
Money



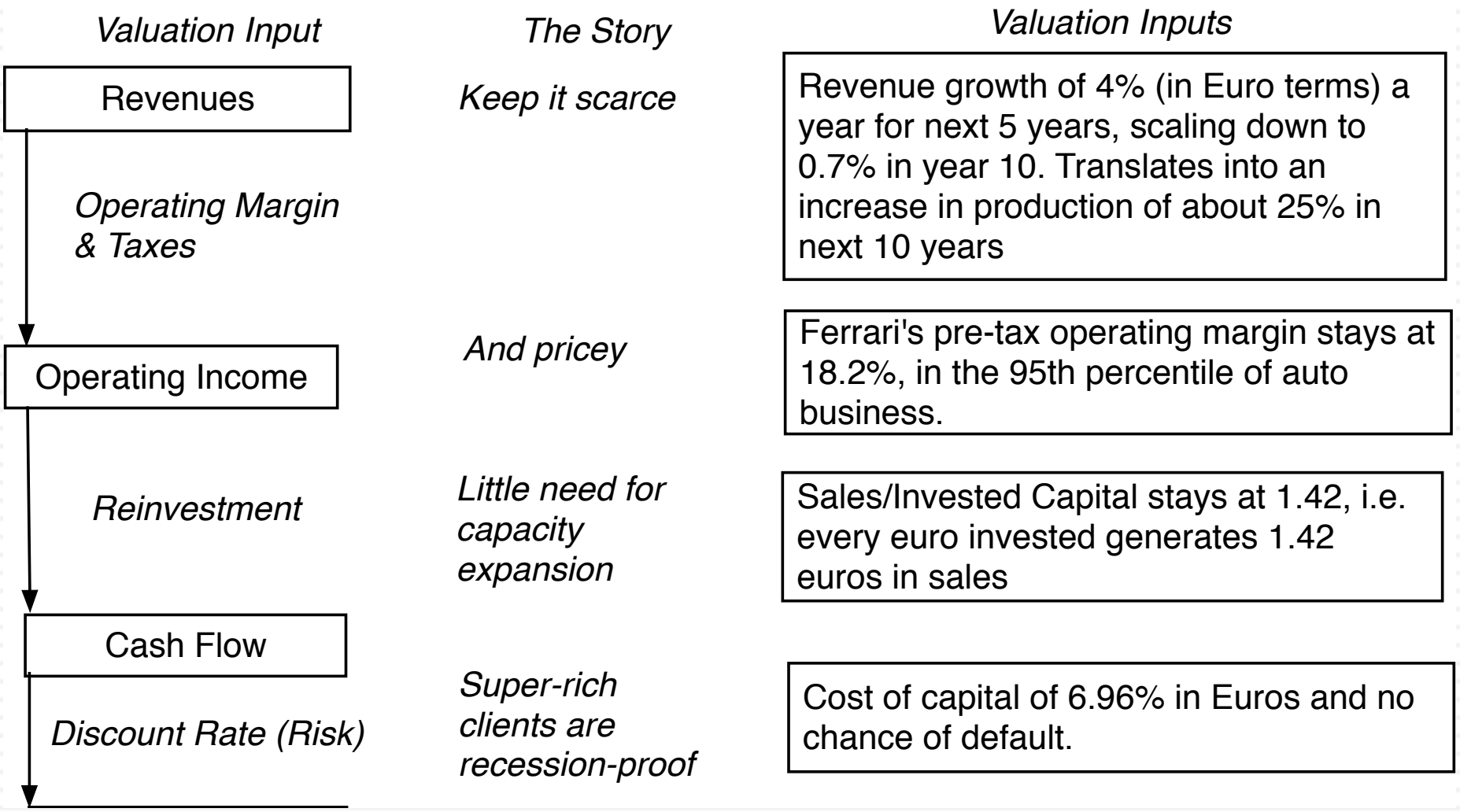
Step 4a: Connect your narrative to key drivers of value



The Uber Link



Ferrari: From story to numbers



Step 4b: Value the company (Uber)

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

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

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

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

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

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

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

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

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

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

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

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

Value of operating assets = $6,595

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

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

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

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

Ferrari: The "Exclusive Club" Value

Stay Super Exclusive: Revenue growth is low

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		4.00%	4.00%	4.00%	4.00%	4.00%	3.34%	2.68%	2.02%	1.36%	0.70%	0.70%
Revenues	€ 2,763	€ 2,874	€ 2,988	€ 3,108	€ 3,232	€ 3,362	€ 3,474	€ 3,567	€ 3,639	€ 3,689	€ 3,714	€ 3,740
EBIT (Operating) margin	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%	18.20%
EBIT (Operating income)	€ 503	€ 523	€ 544	€ 566	€ 588	€ 612	€ 632	€ 649	€ 662	€ 671	€ 676	€ 681
Tax rate	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%
EBIT(1-t)	€ 334	€ 348	€ 361	€ 376	€ 391	€ 407	€ 420	€ 431	€ 440	€ 446	€ 449	€ 452
- Reinvestment		€ 78	€ 81	€ 84	€ 87	€ 91	€ 79	€ 66	€ 51	€ 35	€ 18	€ 22
FCFF		€ 270	€ 281	€ 292	€ 303	€ 316	€ 341	€ 366	€ 389	€ 411	€ 431	€ 431
Cost of capital		6.96%	6.96%	6.96%	6.96%	6.96%	6.96%	6.97%	6.98%	6.99%	7.00%	7.00%
PV(FCFF)		€ 252	€ 245	€ 238	€ 232	€ 225	€ 228	€ 228	€ 227	€ 224	€ 220	

Terminal value	€ 6,835
PV(Terminal value)	€ 3,485
PV (CF over next 10 years)	€ 2,321
Value of operating assets =	€ 5,806
- Debt	€ 623
- Minority interests	€ 13
+ Cash	€ 1,141
Value of equity	€ 6,311

High Prices + No selling cost = Preserve current operating margin

Minimal Reinvestment due to low growth

The super rich are not sensitive to economic downturns

Step 5: Keep the feedback loop open

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

The Uber Feedback Loop: Bill Gurley

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

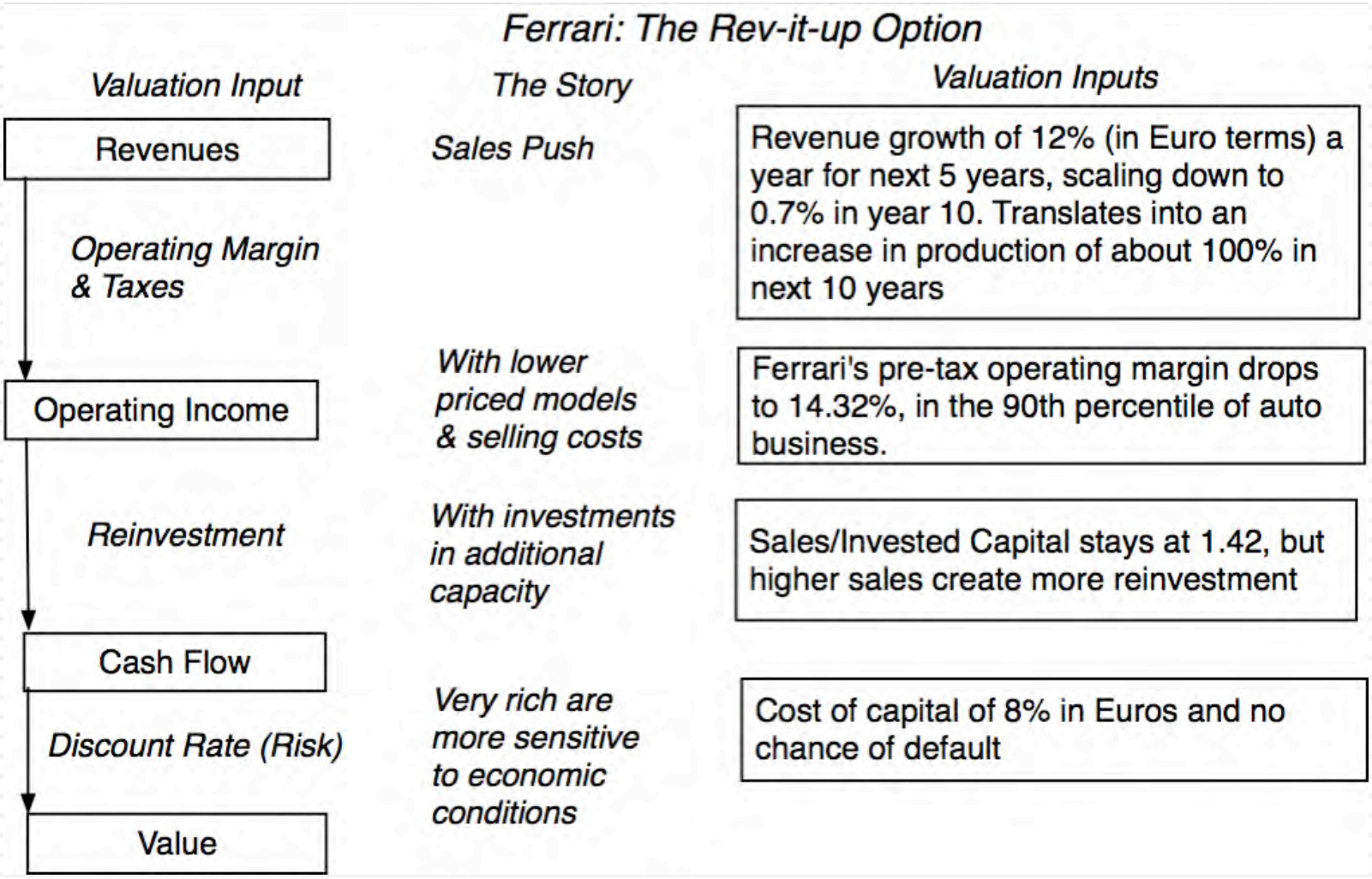
Valuing Bill Gurley's Uber narrative

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

Different narratives, Different Numbers

Total Market	*Growth Effect*	*Network Effect*	*Competitive Advantages*	*Value of Uber*
A4. Mobility Services	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	$90,457
A3. Logistics	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	$65,158
A4. Mobility Services	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	$52,346
A2. All car service	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	$47,764
A1. Urban car service	B4. Double market size	C5. Strong global network effects	D4. Strong & Sustainable	$31,952
A3. Logistics	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	$14,321
A1. Urban car service	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	$7,127
A2. All car service	B3. Increase market by 50%	C3. Strong local network effects	D3. Semi-strong	$4,764
A4. Mobility Services	B1. None	C1. No network effects	D1. None	$1,888
A3. Logistics	B1. None	C1. No network effects	D1. None	$1,417
A2. All car service	B1. None	C1. No network effects	D1. None	$1,094
A1. Urban car service	B1. None	C1. No network effects	D1. None	$799

The Ferrari Counter Narrative



Ferrari: The "Rev-it-up" Alternative

Get less exclusive: Double number of cars sold over next decade

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		12.00%	12.00%	12.00%	12.00%	12.00%	9.74%	7.48%	5.22%	2.96%	0.70%	0.70%
Revenues	€ 2,763	€ 3,095	€ 3,466	€ 3,882	€ 4,348	€ 4,869	€ 5,344	€ 5,743	€ 6,043	€ 6,222	€ 6,266	€ 6,309
EBIT (Operating) margin	18.20%	17.81%	17.42%	17.04%	16.65%	16.26%	15.87%	15.48%	15.10%	14.71%	14.32%	14.32%
EBIT (Operating income)	€ 503	€ 551	€ 604	€ 661	€ 724	€ 792	€ 848	€ 889	€ 912	€ 915	€ 897	€ 904
Tax rate	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%	33.54%
EBIT(1-t)	€ 334	€ 366	€ 401	€ 439	€ 481	€ 526	€ 564	€ 591	€ 606	€ 608	€ 596	€ 600
- Reinvestment		€ 233	€ 261	€ 293	€ 328	€ 367	€ 334	€ 281	€ 211	€ 126	€ 31	€ 35
FCFF		€ 133	€ 140	€ 147	€ 153	€ 159	€ 230	€ 310	€ 395	€ 482	€ 566	€ 565
Cost of capital		8.00%	8.00%	8.00%	8.00%	8.00%	7.90%	7.80%	7.70%	7.60%	7.50%	7.50%
PV(FCFF)		€ 123	€ 120	€ 117	€ 113	€ 108	€ 145	€ 181	€ 215	€ 244	€ 266	

Terminal value	€ 8,315
PV(Terminal value)	€ 3,906
PV (CF over next 10 years)	€ 1,631
Value of operating assets =	€ 5,537
- Debt	€ 623
- Minority interests	€ 13
+ Cash	€ 1,141
Value of equity	€ 6,042

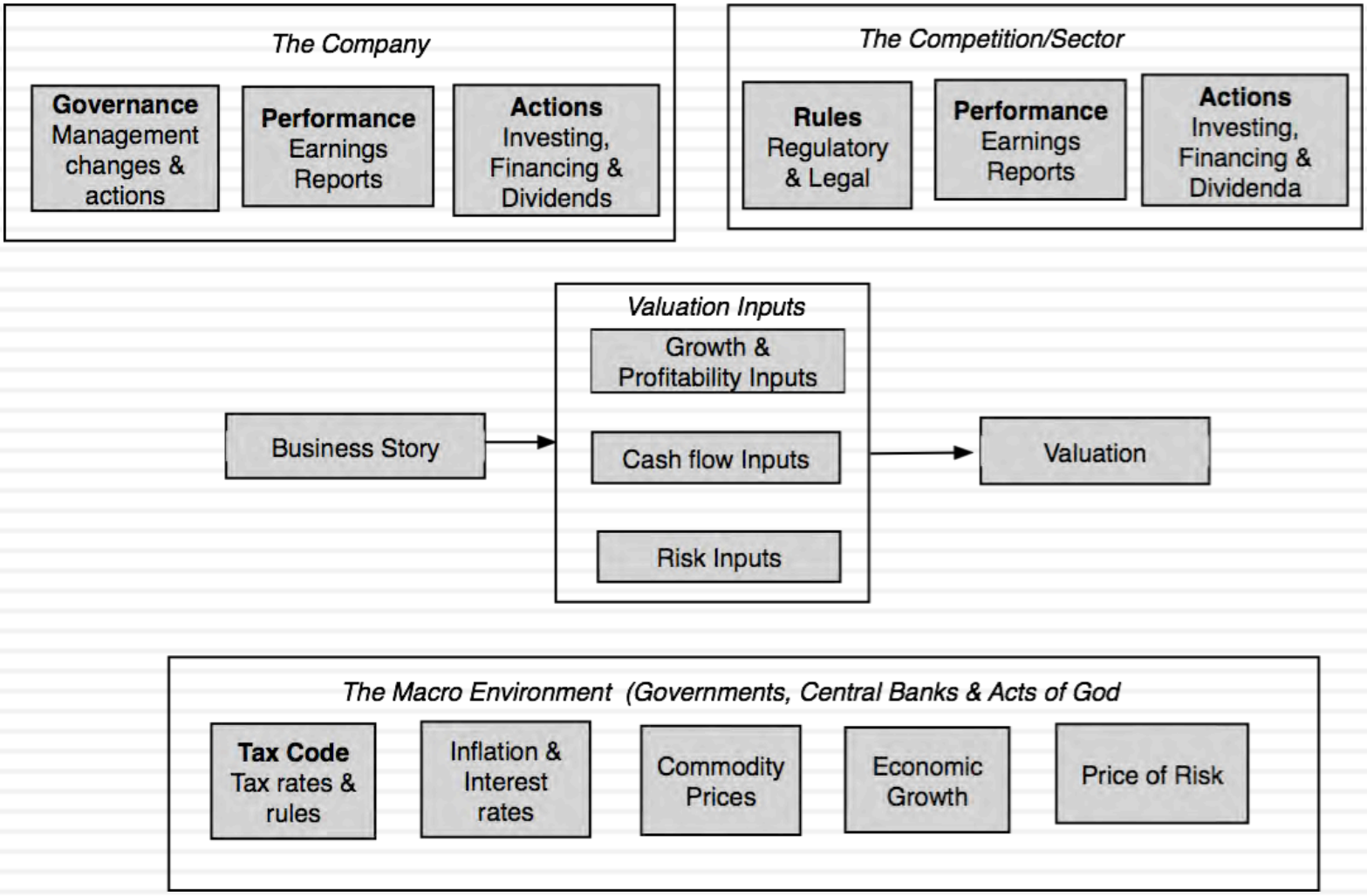
Lower Prices + Some selling cost = Lower operating margin

Reinvestment reflects higher sales

The very rich are more sensitive to economic conditions

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

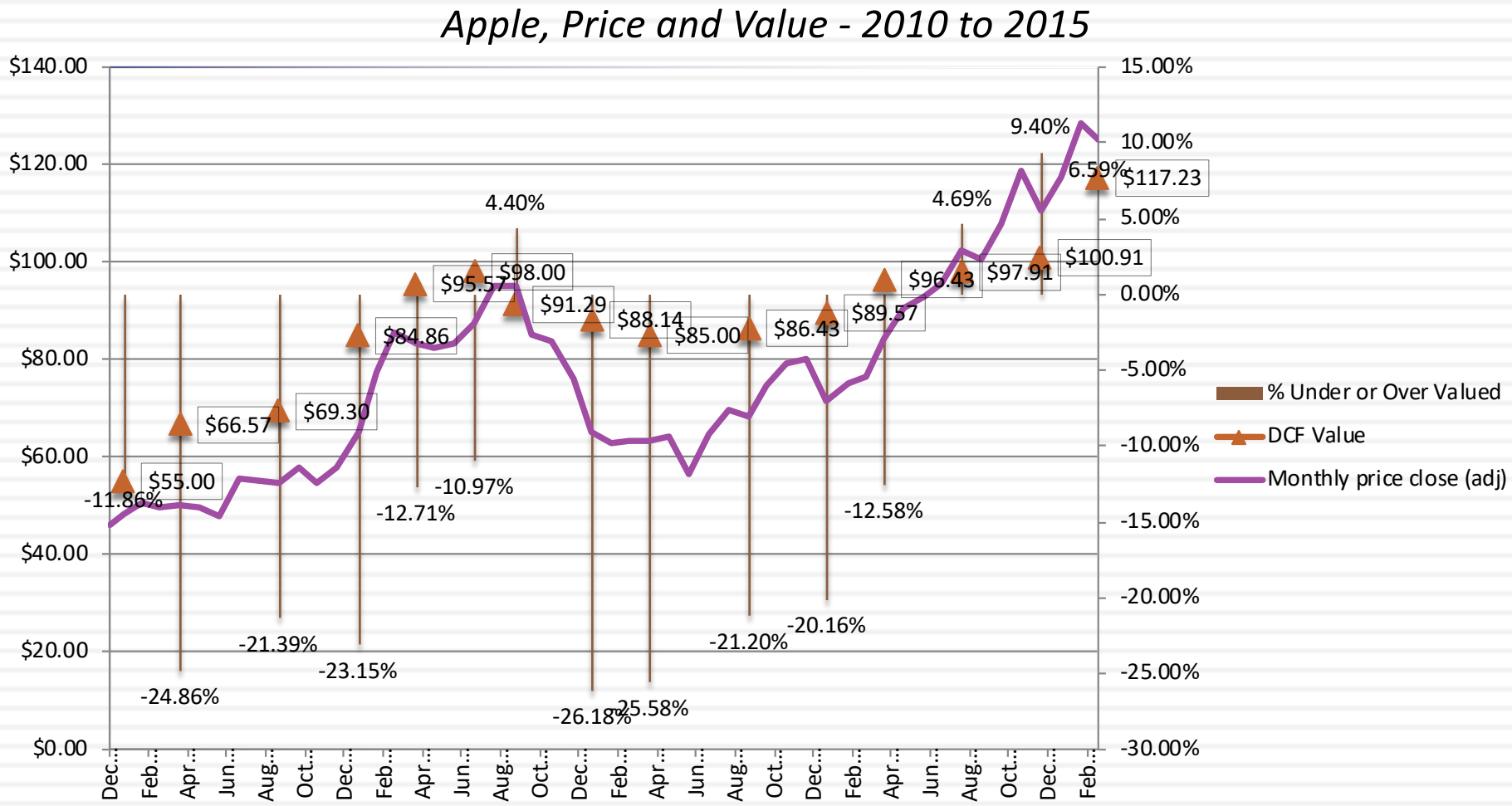
Why narratives change



How narratives change

Narrative Break/End	Narrative Shift	Narrative Change (Expansion or Contraction)
Events, external (legal, political or economic) or internal (management, competitive, default), that can cause the narrative to break or end.	Improvement or deterioration in initial business model, changing market size, market share and/or profitability.	Unexpected entry/success in a new market or unexpected exit/failure in an existing market.
Your valuation estimates (cash flows, risk, growth & value) are no longer operative	Your valuation estimates will have to be modified to reflect the new data about the company.	Valuation estimates have to be redone with new overall market potential and characteristics.
Estimate a probability that it will occur & consequences	Monte Carlo simulations or scenario analysis	Real Options

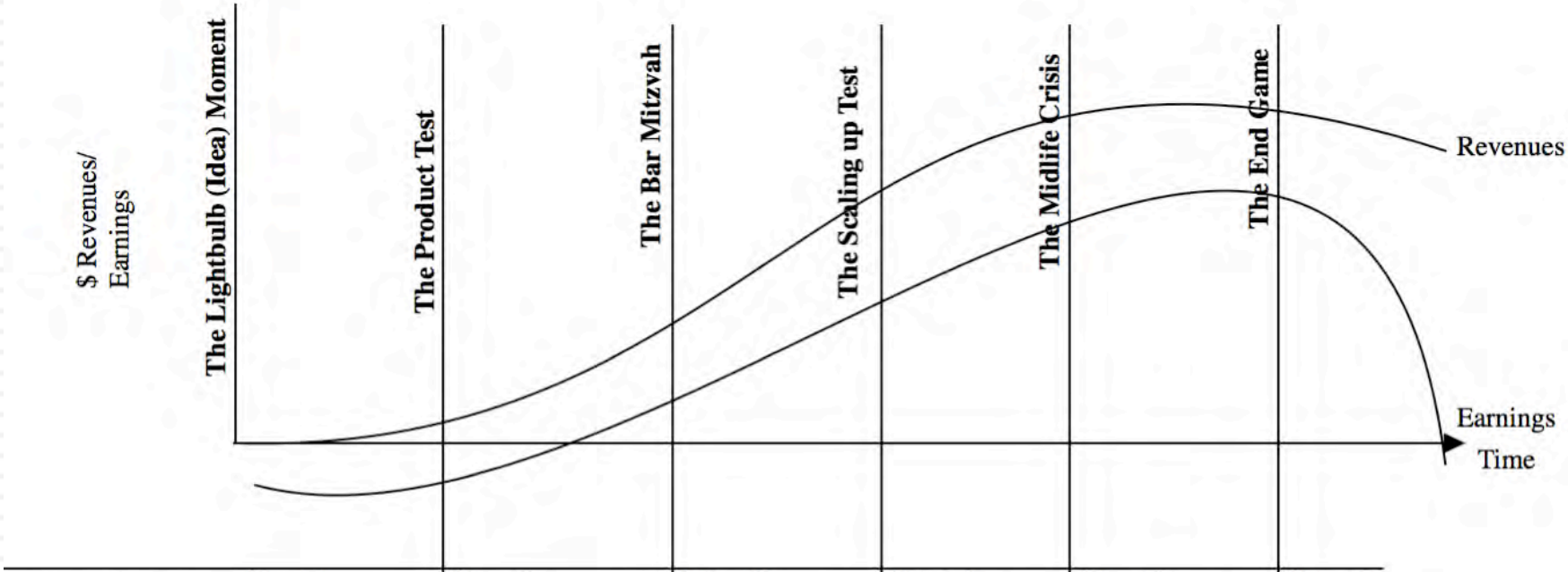
Sometimes your story does not change..



And sometimes it does.. Facebook's Evolution

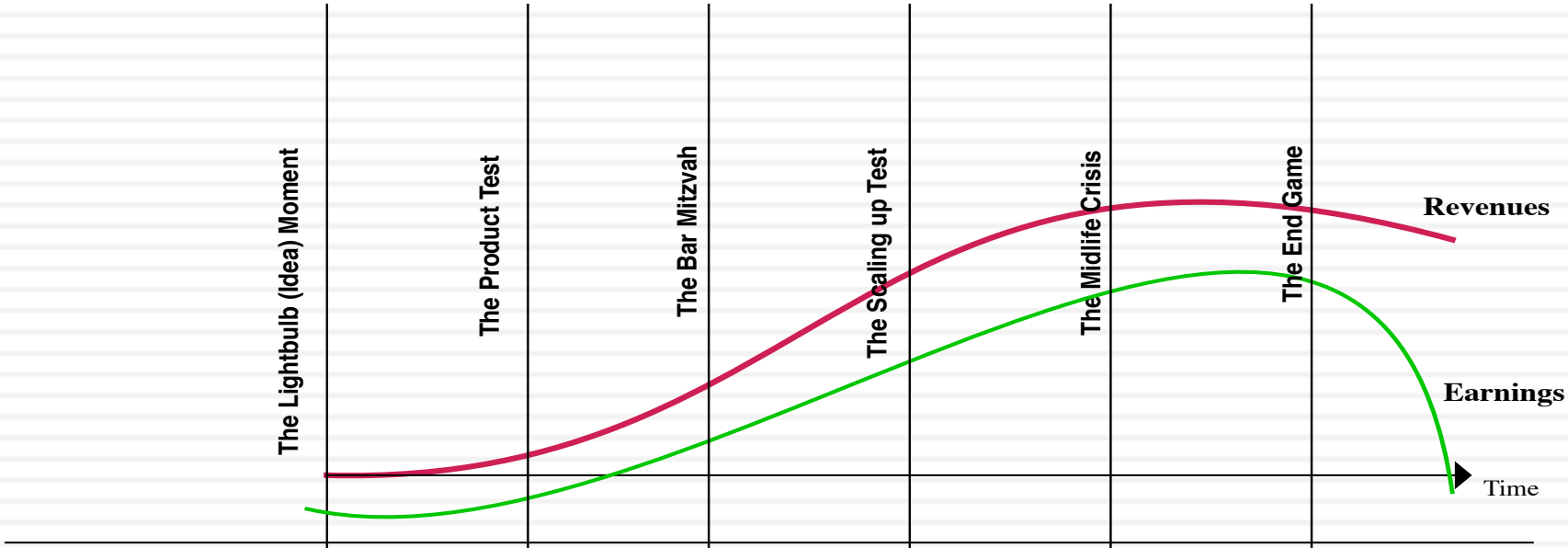
Report Date	Active Users	Mobile Active Users	% of revenue from Mobile	Net Income	Capital	T12m Sales/Capital
7/26/12	955	543	NR	($157)	$3,515	1.23
10/23/12	1010	604	NR	($59)	$4,252	1.09
1/30/13	1060	680	23.00%	$64	$4,120	1.24
5/1/13	1100	751	30.00%	$219	$4,272	1.28
7/24/13	1150	819	41.00%	($152)	$3,948	1.55
10/30/13	1190	874	49.00%	$425	$4,007	1.71
1/29/14	1230	945	53.00%	$523	$4,258	1.85
4/23/14	1280	1010	59.00%	$642	$4,299	2.07
7/23/14	1320	1070	62.00%	$791	$4,543	2.20

Introducing the corporate life cycle



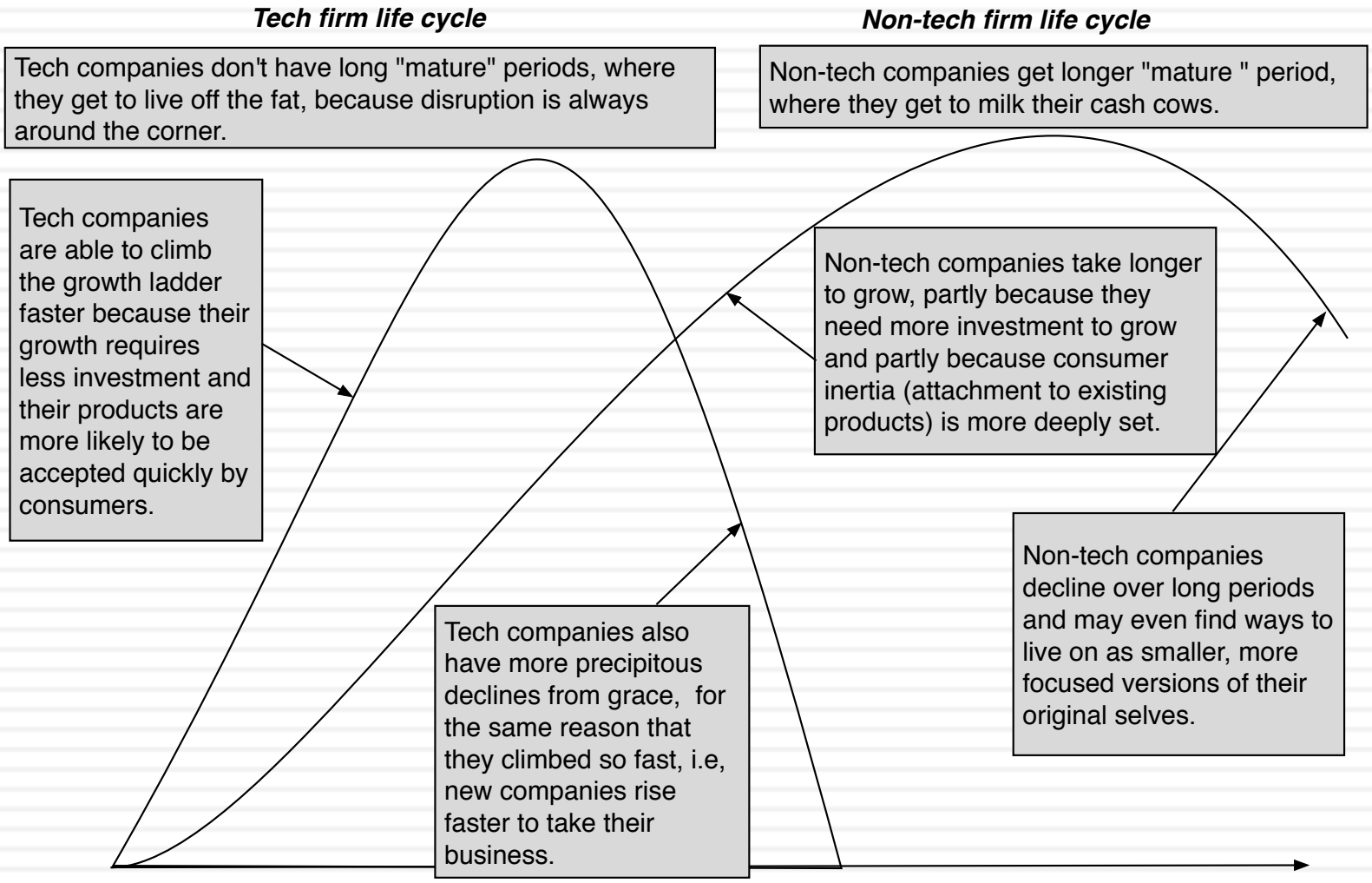
Growth stage	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
Description	Have an idea for a business that meets an unmet need in the market.	Create a business model that converts ideas into potential revenues & earnings	Build the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

Connecting to narratives..



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

The Compressed Life Cycle?



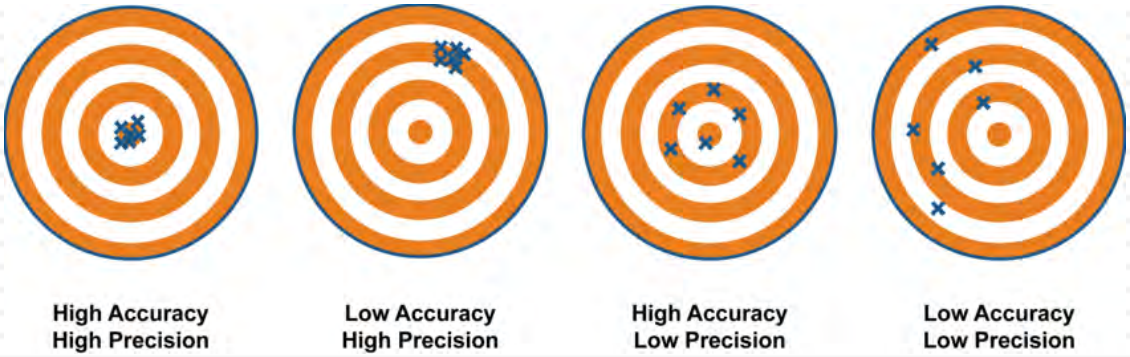
The Consequences

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

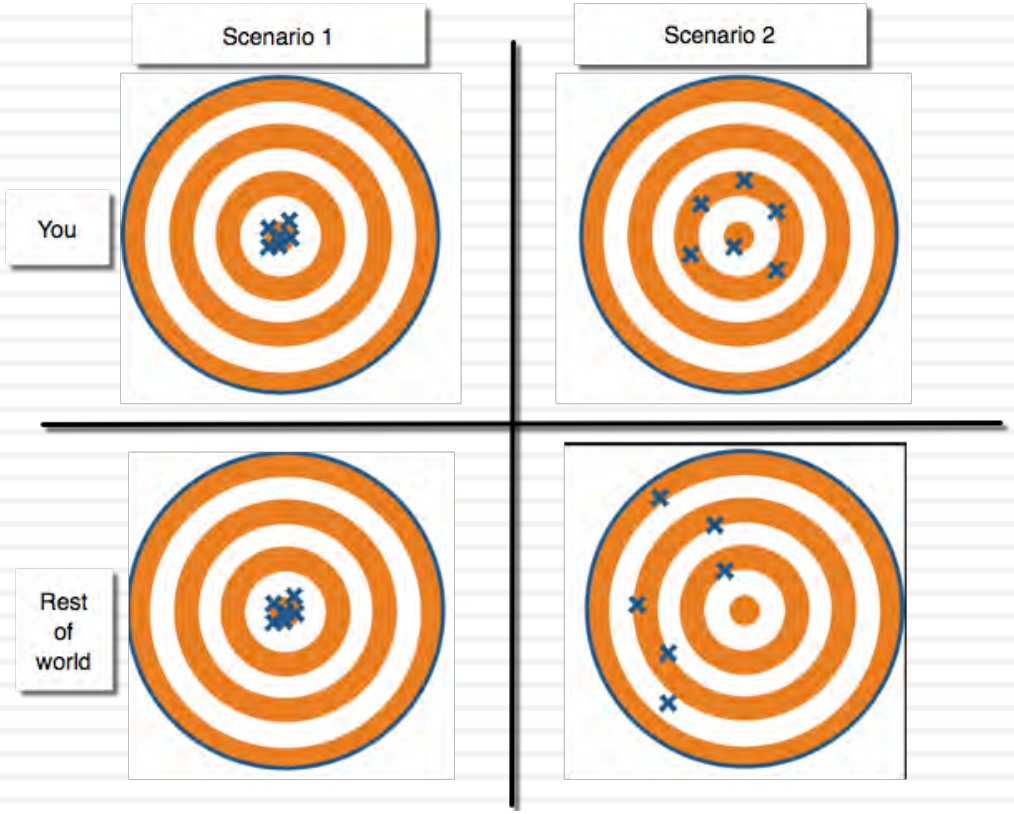
Accuracy is not precision…

Don’t mistake precision for accuracy.. And accuracy for payoff..

Better accurate than precise

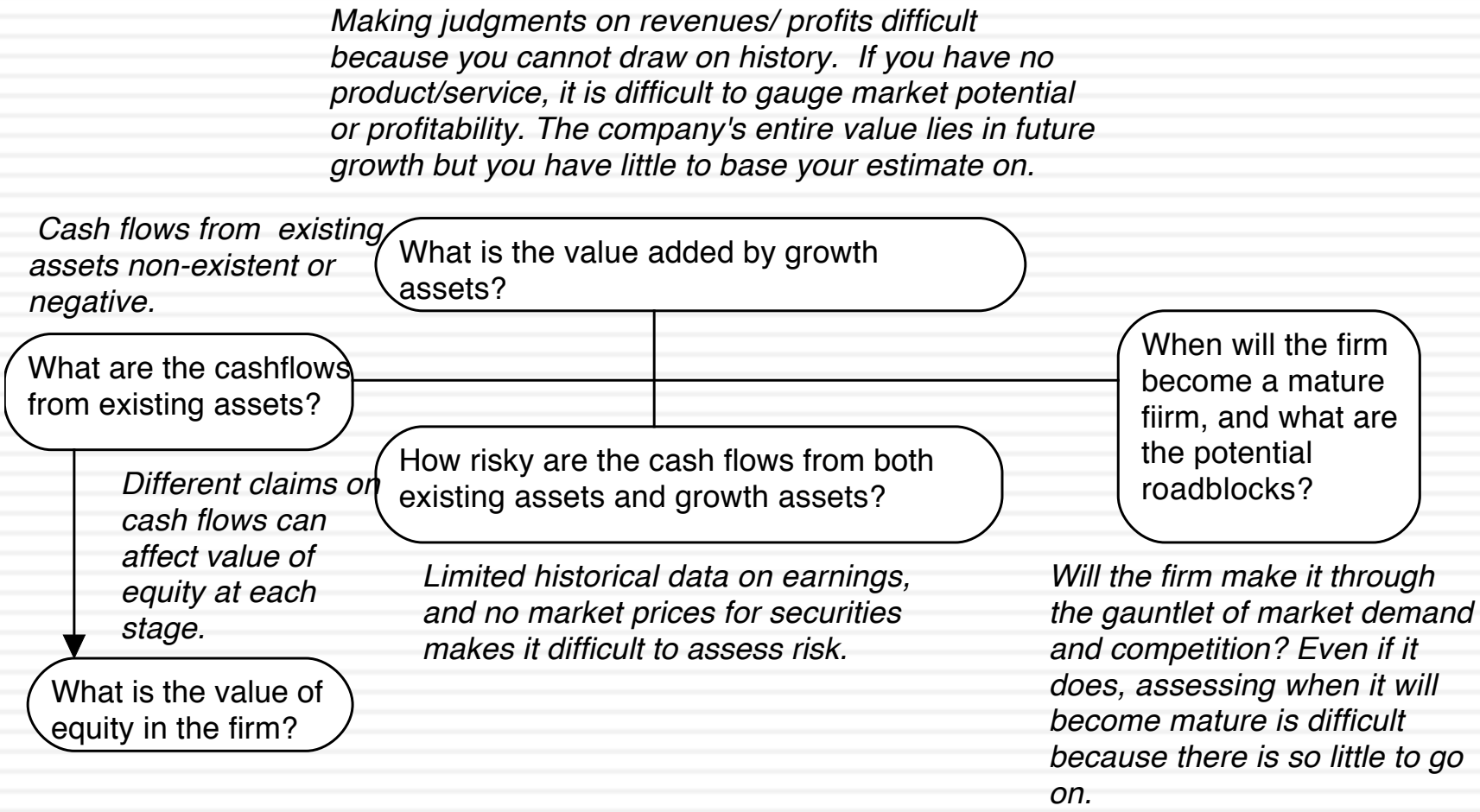


It’s all relative



Valuing a start up 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.

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

		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)

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%
Netlfix	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

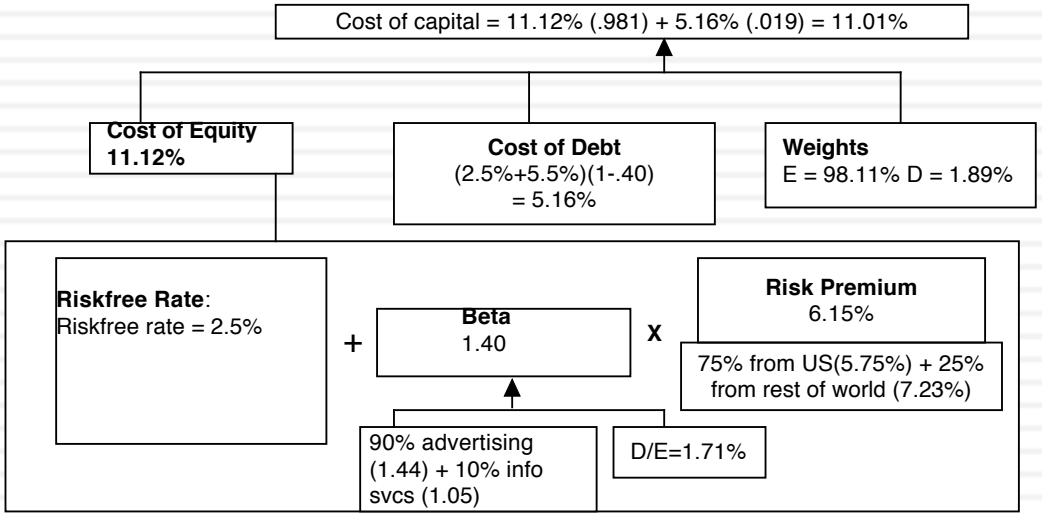
	Sales/ Invested Capital
Twitter (2013)	1.10
Advertising Companies	1.40
Social Media Companies	1.05

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

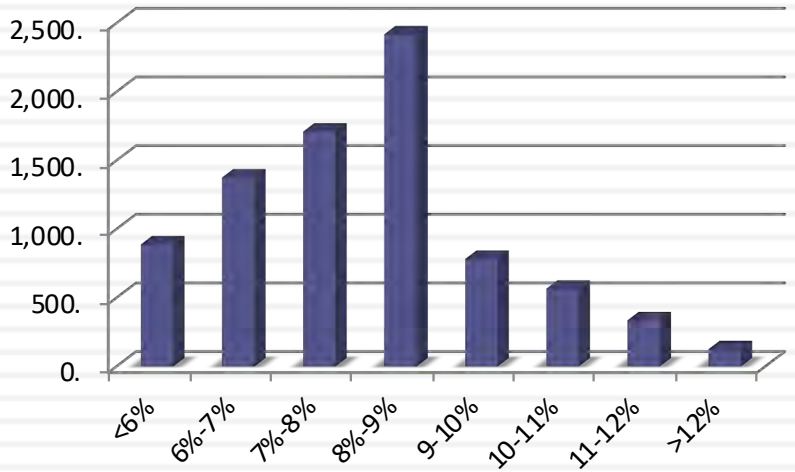
The Cost of Capital for Twitter

Risk in the discount rate

My estimate for Twitter



Cost of Capital: US - Nov '13



0% *Survival Risk* 100%

Probability that the firm will not make it as a going concern

Certain to make it as going concern → *Certain to fail*

My assumption for Twitter

Twitter Pre-IPO Valuation: October 27, 2013

Starting numbers

	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 Value$_{10}$= 1466/(.08-.025) = $26,657

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
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

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

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

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

Cost of Equity
11.12%

Cost of Debt
(2.5%+5.5%)(1-.40)
= 5.16%

Weights
E = 98.1% D = 1.9%

Riskfree Rate:
Riskfree rate = 2.5%

+

Beta
1.40

90% advertising (1.44) + 10% info svcs (1.05)

D/E=1.71%

x

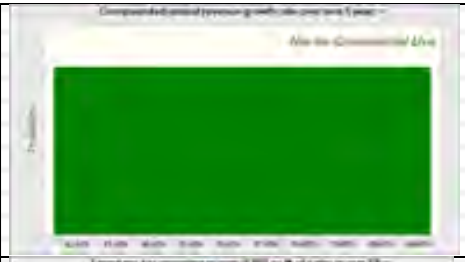
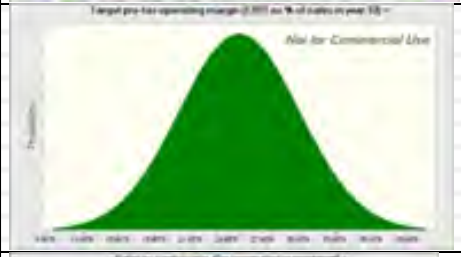
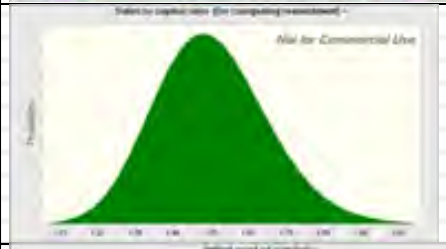
Risk Premium
6.15%

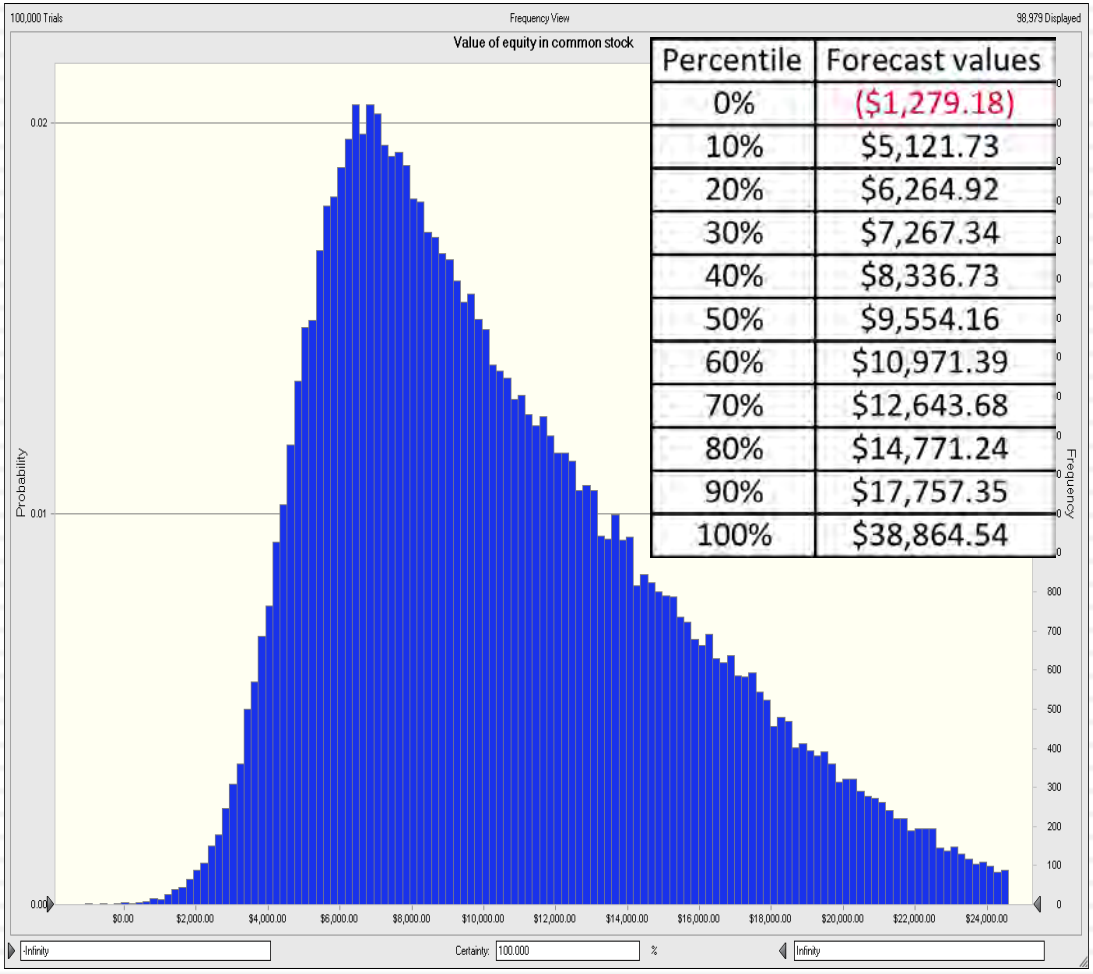
75% from US(5.75%) + 25% from rest of world (7.23%)

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

- 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..

Revenue Growth Rate Distribution: Uniform Expected Value = 55% Minimum Value: 40% Maximum Value: 70%	
Target Operating Margin Distribution: Normal Expected Value = 25% Standard Deviation = 5%	
Sales to Capital Ratio Distribution: Lognormal Expected value: 1.50 Standard deviation: 0.15	
Cost of Capital Distribution: Triangular Expected value: 11.22% Minimum value: 10.02% Maximum value: 12.22%	



Percentile	Forecast values
0%	($1,279.18)
10%	$5,121.73
20%	$6,264.92
30%	$7,267.34
40%	$8,336.73
50%	$9,554.16
60%	$10,971.39
70%	$12,643.68
80%	$14,771.24
90%	$17,757.35
100%	$38,864.54

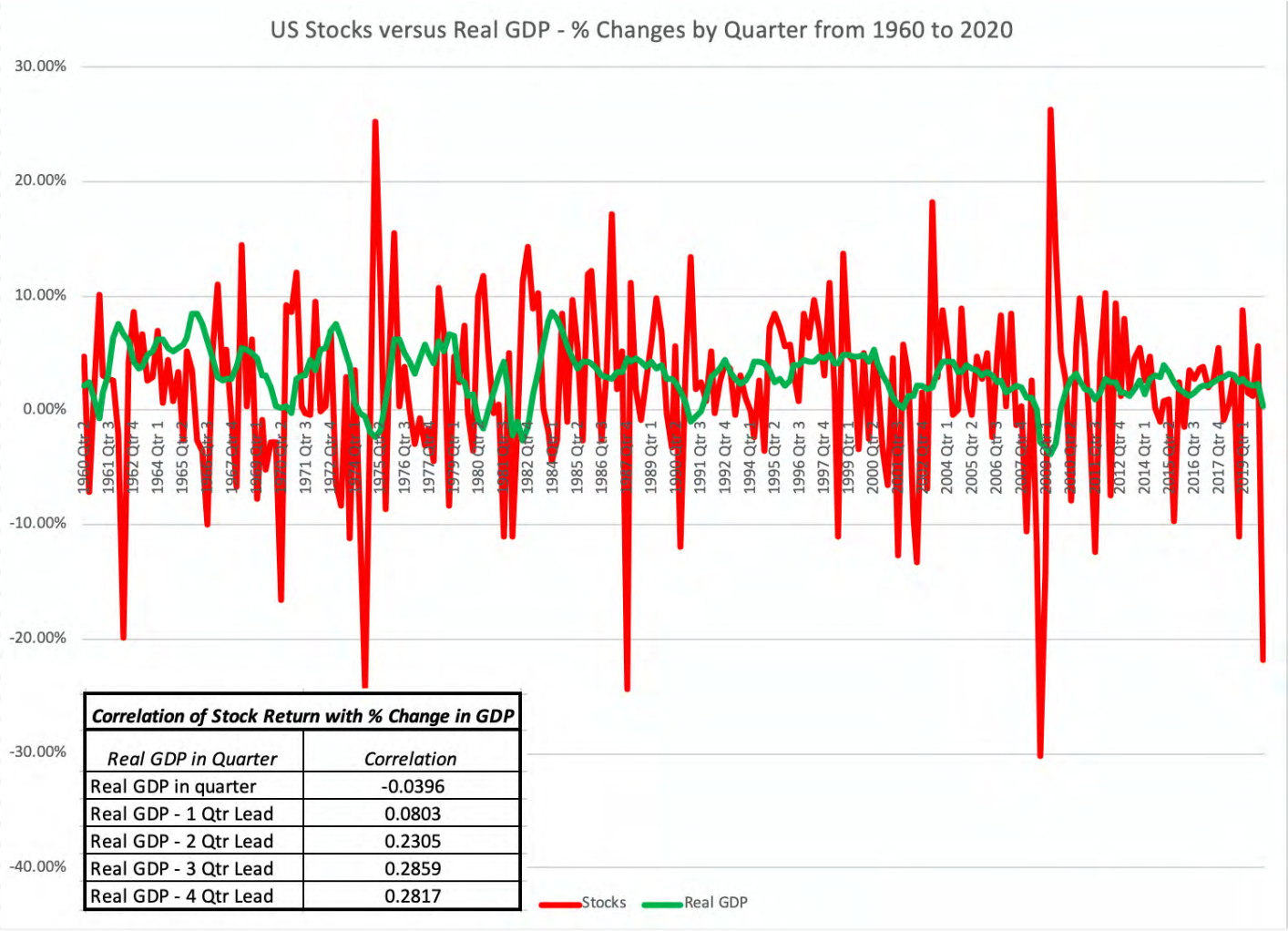
In crisis, the dark side beckons as well…

- If your concept of valuation is downloading last year's financials for a company into a spread sheet and then using historical growth rates, with some mean reversion thrown in, to forecast future numbers, you are probably feeling lost right now, and with good reason.
- It is also not a time to wring our hands, complain that there is too much uncertainty and argue that the fundamentals don't matter.
  - If you do so, you will be drawn to the dark side of investing, where fundamentals don't matter (paradigm shifts, anyone?), new pricing metrics get invented and you are at the mercy of mood and momentum.
- Ironically, it is precisely at times like these that you need to go back to basics.

Market Worries

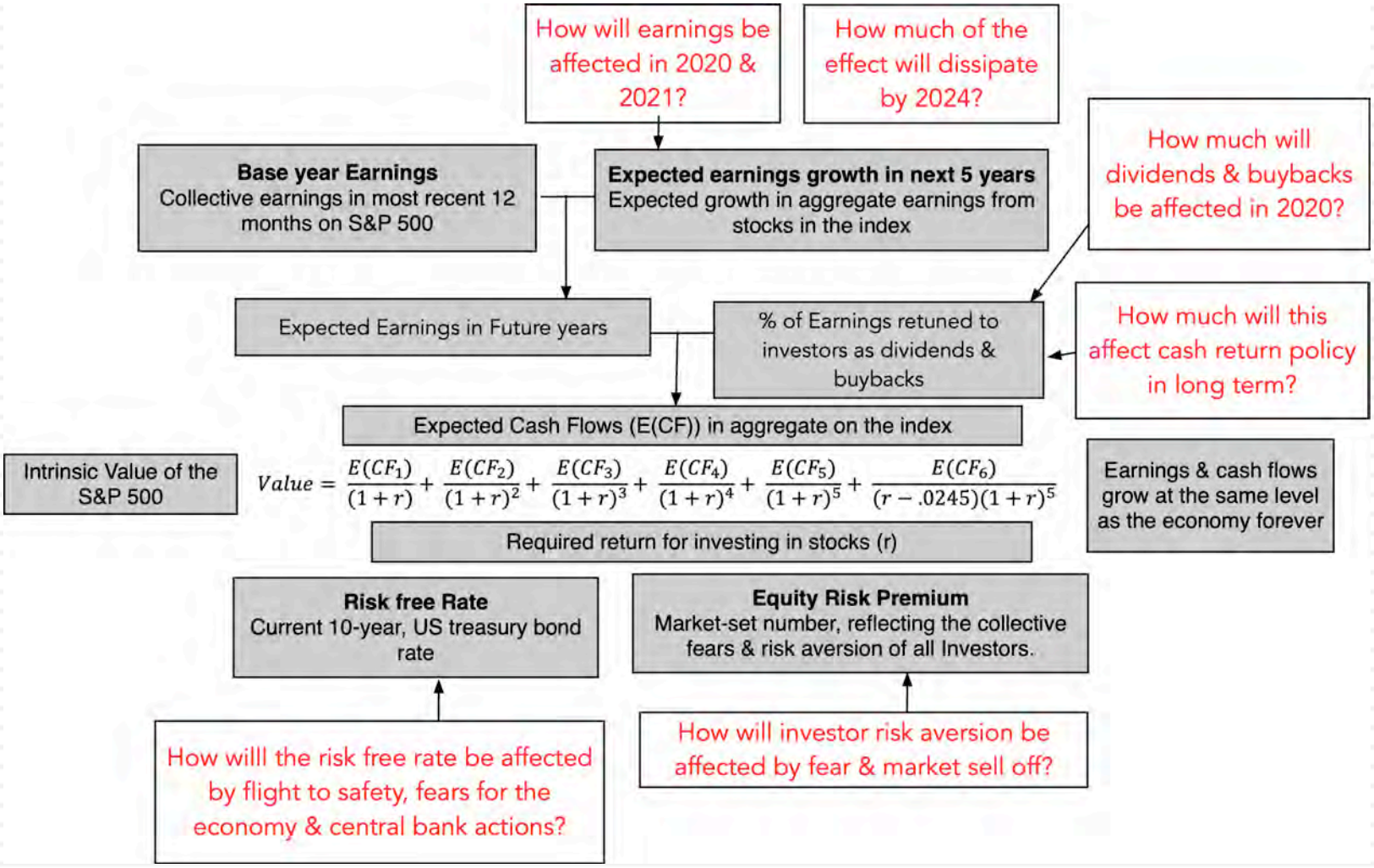
- Disconnect from economic news: For some, the skepticism comes from the disconnect with macroeconomic numbers that are abysmal, as unemployment claims climb into the tens of millions and consumer confidence hovers around historic lows. I will spend the first part of this section arguing that this reflects a fundamental misunderstanding of what markets try to do, and a misreading of history.
- In denial? For others, the question is whether markets are adequately reflecting the potential for long term damage to earnings and cash flows, as well as the cost of defaults, from this crisis. Since that answer to that question lies in the eyes of the beholder, I will provide a framework for converting your fears and hopes into numbers and a value for the market.

Explaining the disconnect…



Correlation of Stock Return with % Change in GDP	
Real GDP in Quarter	*Correlation*
Real GDP in quarter	-0.0396
Real GDP - 1 Qtr Lead	0.0803
Real GDP - 2 Qtr Lead	0.2305
Real GDP - 3 Qtr Lead	0.2859
Real GDP - 4 Qtr Lead	0.2817

Value Drivers for the Index



1. Earnings

Ed Yardeni (6/1/20)	
Year	Earnings on Index
2019	163
2020	120
2021	150

Analyst Consensus (6/1/20)	
Year	Earnings on Index
2019	162.97
2020	125.79
2021	164.04

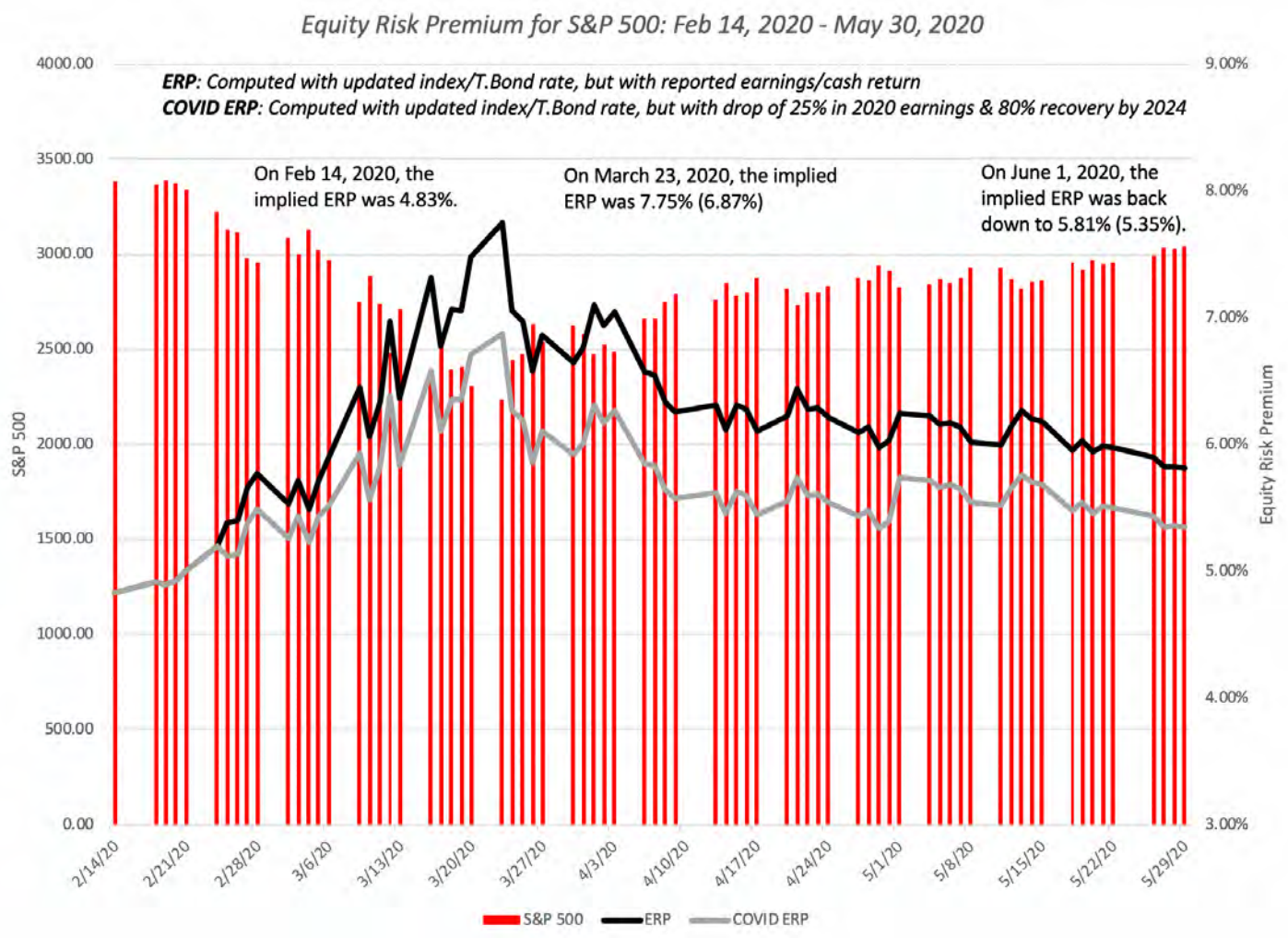
Thomson Reuters (6/1/20)	
Year	Earnings on Index
2019	162.93
2020	125.22
2021	163.67

Market Strategists Forecasts for S&P 500 Earnings in 2020		
Firm	*Strategist*	*2020 EPS Estimate*
Bank of America Merrill Lynch	Savita Subramanian	$115.00
Barclays	Maneesh Deshpande	$119.00
BMO	Brian Belski	Suspended
BTIG	Julian Emanuel	$127.00
Canaccord Genuity	Tony Dwyer	$128.00
CFRA	Sam Stovall	$162.37
Citigroup	Tobias Levkovich	$125.00
Credit Suisse	Jonathan Golub	$125.00
Deutsche Bank	Binky Chadha	$133.00
Goldman Sachs	David Kostin	$110.00
JPMorgan Chase	Dubravko Lakos-Bujas	$150.00
Morgan Stanley	Mike Wilson	$130.00
Oppenheimer	John Stoltzfus	Suspended
RBC	Lori Calvasina	$135.00
UBS	Francois Trahan	$140.00
Wells Fargo Investment Institute	Darrell Cronk	$115.00
	Average	**$129.60**
	Median	**$127.50**
	High	**$162.37**
	Low	**$110.00**

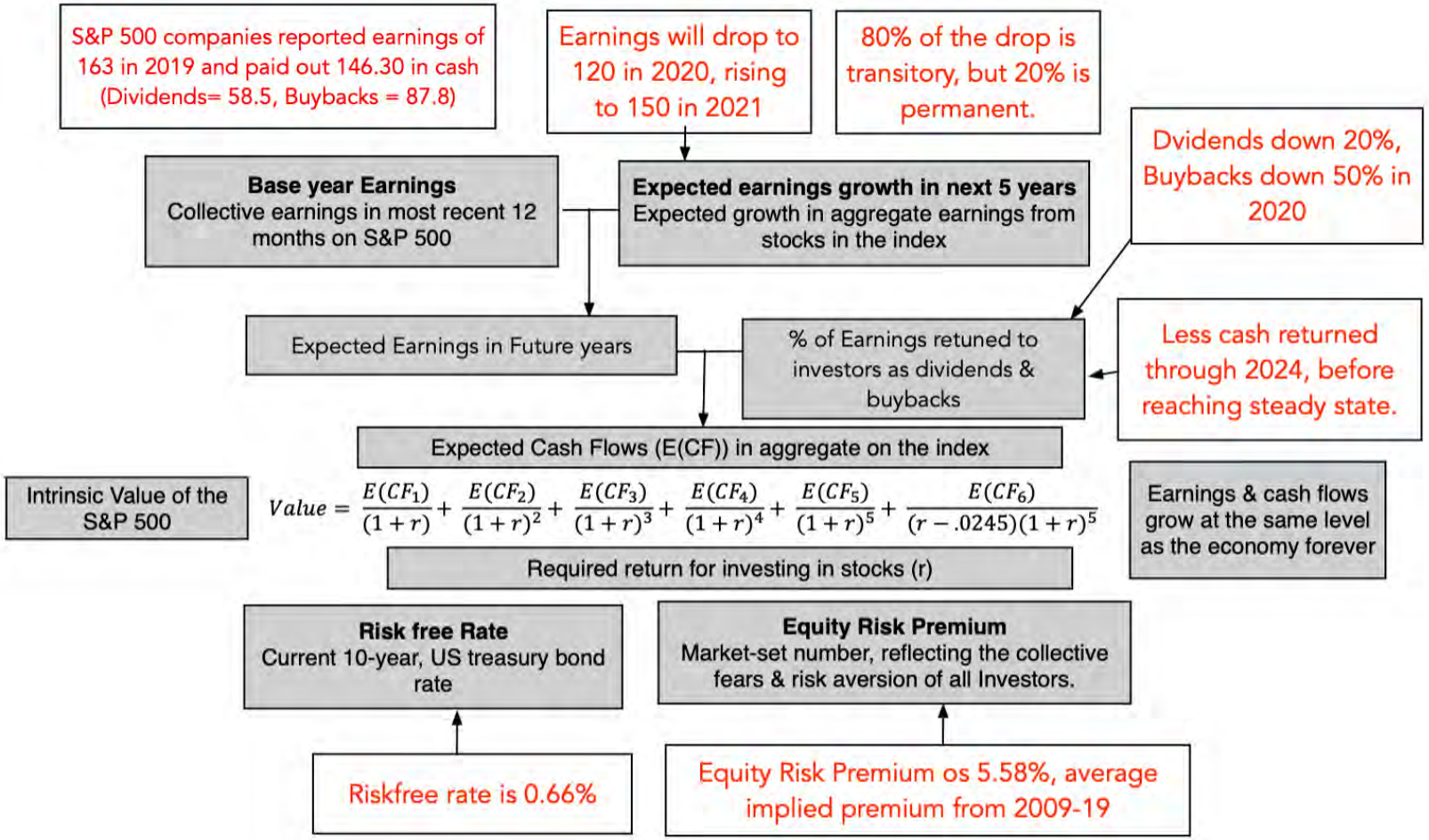
2. Cash Flows

	S&P 500					
Year	Market value	Earnings	Dividends	Buybacks	Cash Returned as % of Earnings	Cash Returned as % of Market Cap
2001	1148.09	38.85	15.74	14.34	77.43%	2.62%
2002	879.82	46.04	15.96	13.87	64.78%	3.39%
2003	1111.91	54.69	17.88	13.70	57.74%	2.84%
2004	1211.92	67.68	19.01	21.59	59.99%	3.35%
2005	1248.29	76.45	22.34	38.82	80.01%	4.90%
2006	1418.30	87.72	25.04	48.12	83.40%	5.16%
2007	1468.36	82.54	28.14	67.22	115.53%	6.49%
2008	903.25	49.51	28.45	39.07	136.37%	7.47%
2009	1115.00	56.86	21.97	15.46	65.82%	3.36%
2010	1257.64	83.77	22.65	32.88	66.28%	4.42%
2011	1257.60	96.44	26.53	44.75	73.91%	5.67%
2012	1426.19	96.82	31.25	44.65	78.39%	5.32%
2013	1848.36	104.92	34.90	53.23	84.00%	4.77%
2014	2058.90	116.16	39.55	62.44	87.79%	4.95%
2015	2043.94	100.48	43.41	64.94	107.83%	5.30%
2016	2238.82	106.26	45.70	62.32	101.66%	4.82%
2017	2673.61	124.51	48.93	60.85	88.17%	4.11%
2018	2506.85	152.78	54.39	96.11	98.51%	6.00%
2019	3230.78	163.00	58.50	87.81	89.76%	4.53%
				Median	83.40%	4.82%
				High	136.37%	7.47%
				Low	57.74%	2.84%

3. Risk


Equity Risk Premium for S&P 500: Feb 14, 2020 - May 30, 2020
ERP: Computed with updated index/T.Bond rate, but with reported earnings/cash return
COVID ERP: Computed with updated index/T.Bond rate, but with drop of 25% in 2020 earnings & 80% recovery by 2024
On Feb 14, 2020, the implied ERP was 4.83%.
On March 23, 2020, the implied ERP was 7.75% (6.87%)
On June 1, 2020, the implied ERP was back down to 5.81% (5.35%).
S&P 500
Equity Risk Premium
4000.00
3500.00
3000.00
2500.00
2000.00
1500.00
1000.00
500.00
0.00
9.00%
8.00%
7.00%
6.00%
5.00%
4.00%
3.00%
2/14/20
2/21/20
2/28/20
3/6/20
3/13/20
3/20/20
3/27/20
4/3/20
4/10/20
4/17/20
4/24/20
5/1/20
5/8/20
5/15/20
5/22/20
5/29/20
S&P 500
ERP
COVID ERP

My Story for the Market



My Valuation of the Index

Earnings drop to 120 in 2020, rise to 150 in 2021 & recover 80% of the loss by 2024

Dividends drop by 20% & buybacks by 50% in 2020, and cash returned lower through 2024

Earnings and Cash Return: Pre- versus Post-Corona Estimates						
	Pre-Corona		*Post-Corona*		*Corona Effect*	
Year	*Earnings*	*Cash Return*	*Earnings*	*Cash Return*	*Earnings*	*Cash Return*
2020	169.18	153.93	120.00	90.71	-29.07%	-41.07%
2021	175.59	161.93	150.00	121.01	-14.57%	-25.27%
2022	182.24	170.32	160.83	137.93	-11.75%	-19.02%
2023	189.15	179.11	172.45	156.66	-8.83%	-12.54%
2024	196.32	188.32	184.91	177.37	-5.81%	-5.81%
2025	197.62	189.56	186.13	178.54	-5.81%	-5.81%

Growth rate in perpetuity capped at 0.66%

Riskfree rate is T.Bond rate of 0.66%

.066%+5.58% = 6.24%

ERP stays at 5.58%, average from 2009-19

Intrinsic Value Estimate (based on your choice of ERP) based upon post-Corona numbers							
	Last 12 months	1	2	3	4	5	*Terminal Year*
Expected Earnings	$163.00	120.00	150.00	160.83	172.45	184.91	186.13
Expected cash payout (divi	89.75%	75.59%	80.67%	85.76%	90.84%	95.93%	95.93%
Expected Dividends + Buy	$146.30	$90.71	$121.01	$137.93	$156.66	$177.37	178.54
Expected Terminal Value =						$ 3,200.86	
Present Value =		$ 85.38	$ 107.21	$ 115.03	$ 122.98	$ 2,496.27	
Intrinsic Value of Index =		2926.87					
Intrinsic PE (with 2020 E)		24.39					
Intrinsic CAPE		25.69					

$$\frac{90.71}{(1.0624)}+\frac{121.01}{(1.0624)^2}+\frac{137.93}{(1.0624)^3}+\frac{156.66}{(1.0624)^4}+\frac{177.37}{(1.0624)^5}+\frac{177.37(1.0066)}{(.0624-.0066)(1.0624)^5}=2926.87$$

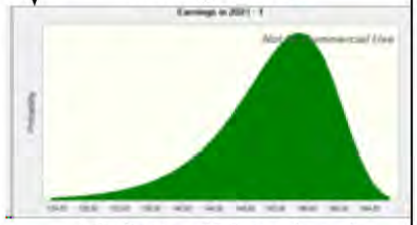
Facing up to uncertainty

Earnings in 2020

Likeliest = 127.5; Scale = 6

Correlation = 0.50

Earnings in 2021

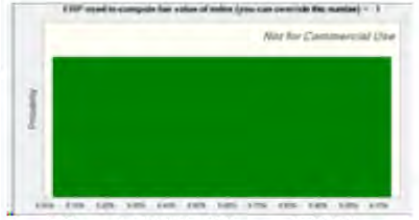


Likeliest = 155; Scale = 6

Correlation =-.25

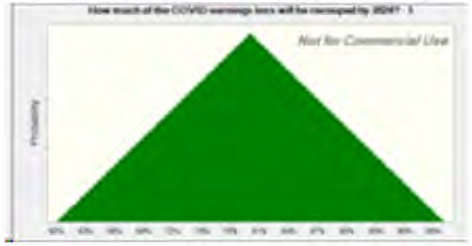
The lower earnings are in 2020, the higher the equity risk premium

Equity Risk Premium



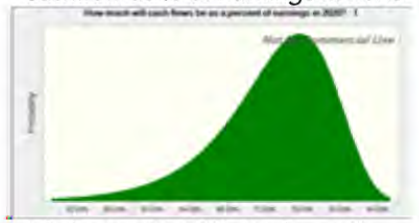
Min = 5.02%; Max = 6.14%

% of Lost Earnings recouped by 2024



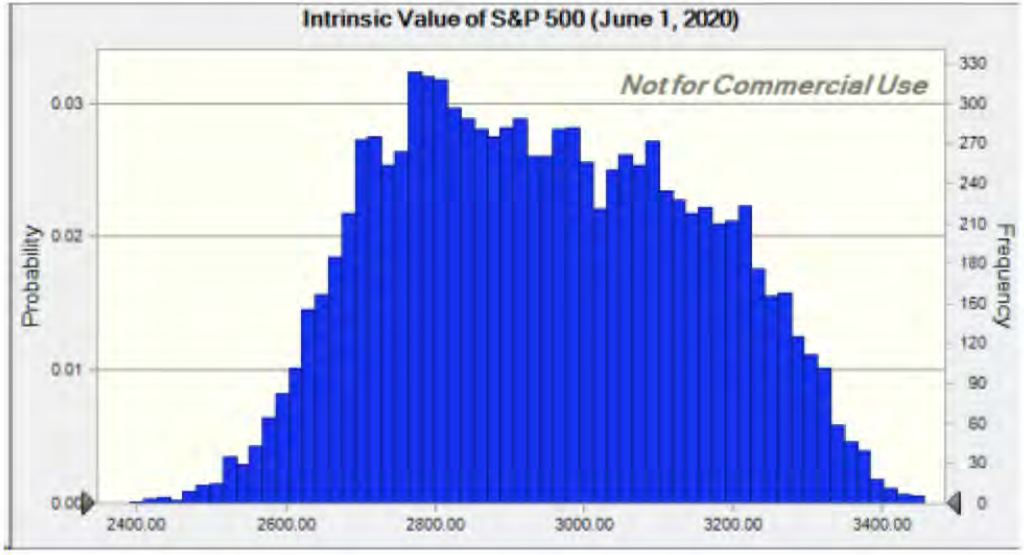
Min = 60%; Max = 100%

Cashflow as % of Earnings in 2020

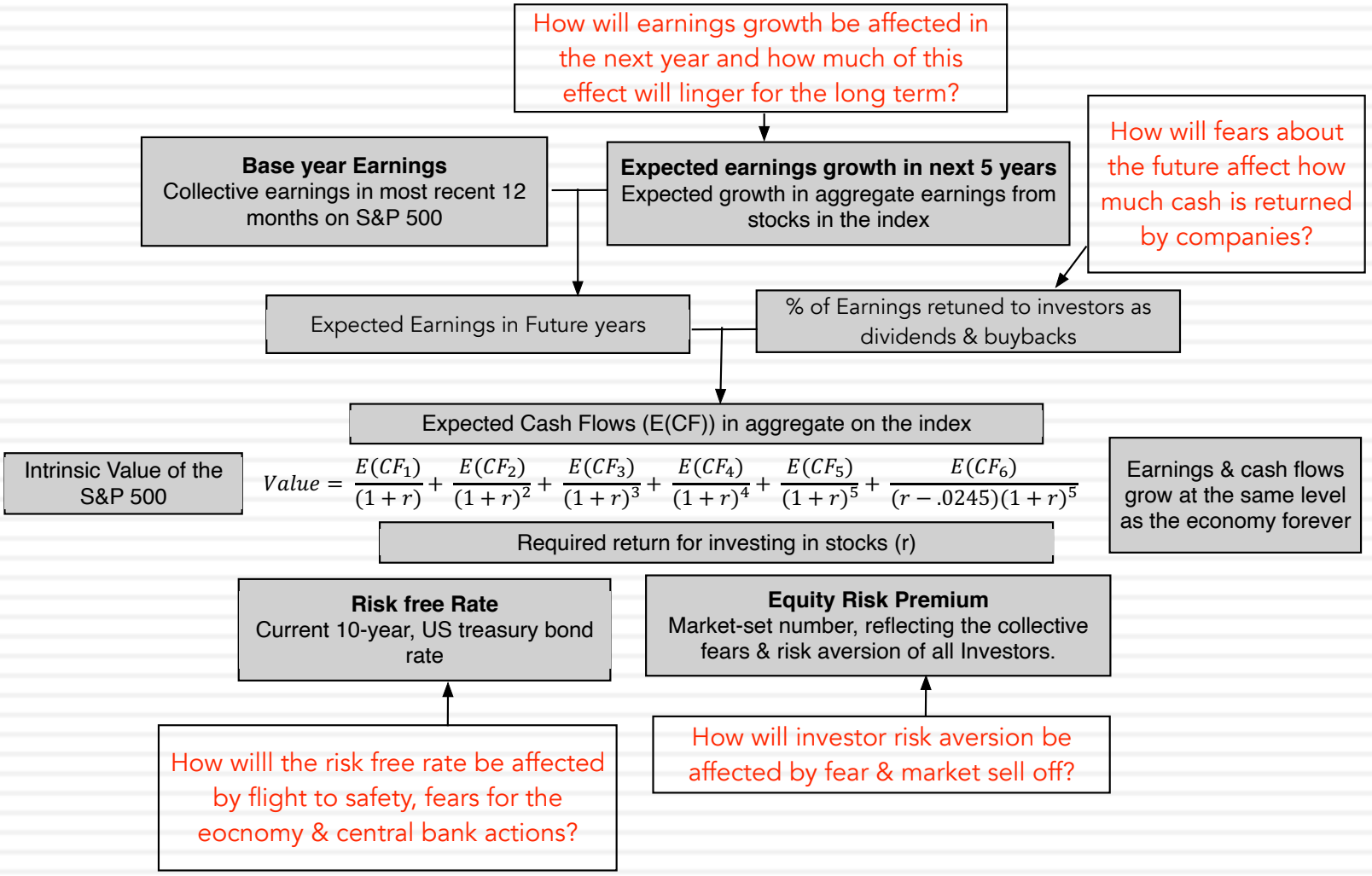


Likeliest = 75.59%; Scale = 6%

Percentile	Forecast values
0%	2277.04
10%	2685.17
20%	2752.07
30%	2809.79
40%	2870.31
50%	2932.91
60%	2999.98
70%	3072.14
80%	3144.45
90%	3226.31
100%	3455.33

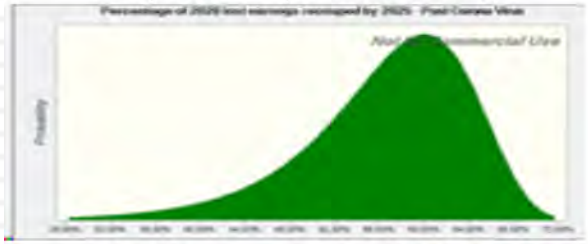


Valuing the Market: COVID effect

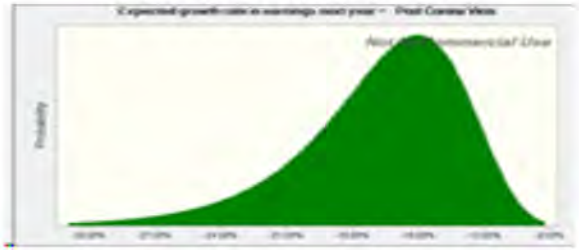


What now? Valuing the Index

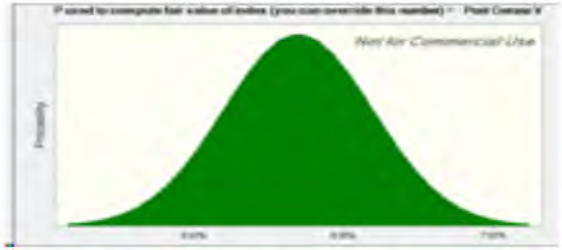
Expected drop in 2020 Earnings



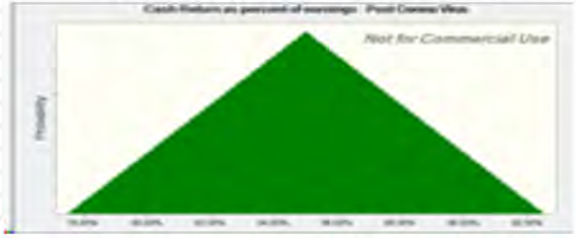
% of drop recouped by 2025



Equity Risk Premium

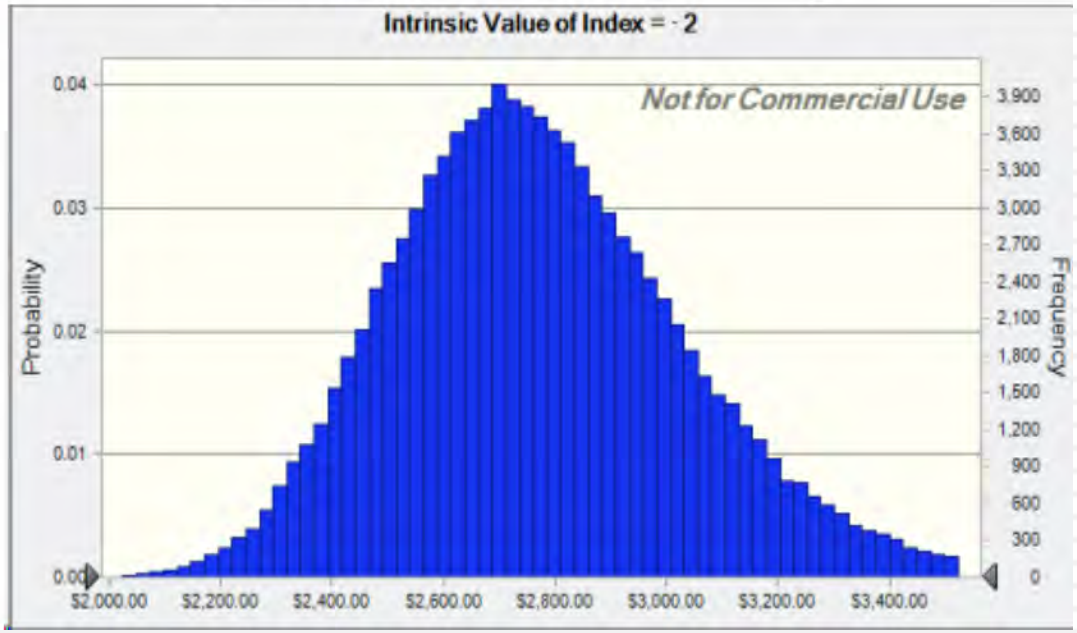


Cash Returned as % of Earnings

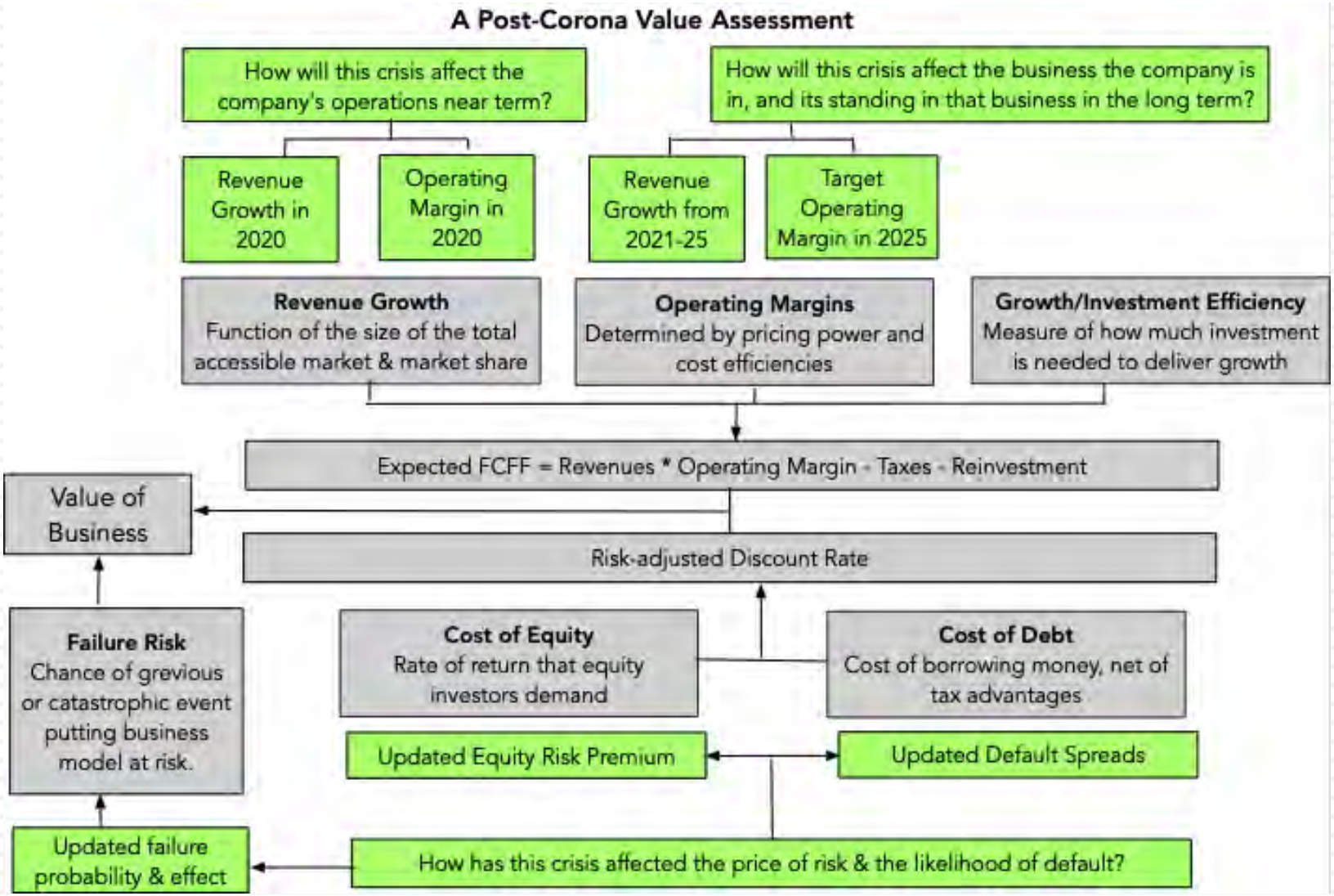


Valuing the S&P 500 Index: March 13, 2020

Percentile	*S&P 500 Index*
0%	$1,903.33
10%	$2,450.16
20%	$2,547.91
30%	$2,621.98
40%	$2,688.01
50%	$2,750.84
60%	$2,817.83
70%	$2,893.02
80%	$2,986.04
90%	$3,123.78
100%	$4,452.38



Valuing Individual Stocks: A Post-Corona Version



Zoom						5/11/20

The Story

Zoom is poised to take advantage of an explosion in the online meeting/seminar market, as the crisis changes behavior for the long term on both fronts. While there will be multiple players in the markets, some with deep pockets (Cisco's Webex, Microsoft's team and Google's whatever), Zoom will grab a dominant market shares, both because of its first mover advantages and networking benefits. As it grows, it will benefit from economies of scale and its margins will converge on those of software companis collectively. Its cost of capital reflects its business services model, but since it is young and not fully formed, there remains a chance of failure.

The Assumptions

	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 623	55.00%	→ 2.00%		2.00%	Growing online market + Mkt share
Operating margin (b)	9.70%	9.70%	→ 22.25%		22.25%	Software company margins
Tax rate	25.00%	25.00%	→ 25.00%		25.00%	Global/US marginal tax rate
Reinvestment (c)		Sales to capital ratio	2.25	RIR =	29.34%	Drop from current level + higher than industry
Return on capital	23.64%	Marginal ROIC =	51.27%		6.82%	Low capital intensity + High margin model
Cost of capital (d)		7.72%	→ 6.82%		6.82%	Close to average company's cost of capital

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 965	12.21%	$ 118	$ 88	$ 152	$ (64)
2	$ 1,496	14.72%	$ 220	$ 165	$ 236	$ (71)
3	$ 2,319	17.23%	$ 400	$ 300	$ 366	$ (66)
4	$ 3,594	19.74%	$ 710	$ 532	$ 567	$ (35)
5	$ 5,571	22.25%	$ 1,240	$ 930	$ 879	$ 51
6	$ 8,045	22.25%	$ 1,790	$ 1,342	$ 1,099	$ 243
7	$ 10,764	22.25%	$ 2,395	$ 1,796	$ 1,208	$ 588
8	$ 13,261	22.25%	$ 2,951	$ 2,213	$ 1,110	$ 1,103
9	$ 14,932	22.25%	$ 3,322	$ 2,492	$ 743	$ 1,749
10	$ 15,230	22.25%	$ 3,389	$ 2,542	$ 133	$ 2,409
Terminal year	$ 15,535	22.25%	$ 3,457	$ 2,593	$ 761	$ 1,832

The Value

Terminal value	$ 38,036		
PV(Terminal value)	$ 18,541		
PV (CF over next 10 years)	$ 3,043		
Value of operating assets =	$ 21,583		
Adjustment for distress	$ 1,727	Probability of failure =	10.00%
- Debt & Mnority Interests	$ 119		
+ Cash & Other Non-operating assets	$ 855		
Value of equity	$ 20,593		
- Value of equity options	$ 1,121		
Number of shares	276.40		
Value per share	$ 70.45	Stock was trading at =	$146.48

Boeing						03/21/20
Slip, slipping away!						
In the face of the Covid-19 pandemic, the protracted impact on the airline industry, and the struggles in the past of the 737 Max, BA faces a tough path forward over the next 5 years. With the assumption that air travel will not return to its pre- Covid-19 levels for the next 4-6 quarters, BA will have negative growth. Furthermore, given BA's debt-heavy balance sheet, there will also be limited re-investment given that that paying down the debt is the priority. Thus, risk remains high						
The Assumptions						
	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 76,559	-15.00% →	2.00%		2.00%	Continued slowing of growth
Operating margin (b)	-2.82%	-2.82% →	11.00%		11.00%	With pressure on margins
Tax rate	25.00%	25.00% →	25.00%		25.00%	& Convergence to global tax rate
Reinvestment (c)		Sales to capital ratio	0.00	RIR =	16.67%	Business stays capital intensive
Return on capital	-9.31%	Marginal ROIC =	121.07%		12.00%	But competitive advantages fade
Cost of capital (d)		7.40% →	7.00%		7.00%	As cost of capital stays low
The Cash Flows						
	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 65,075	-5.00%	$ (3,254)	$ (3,254)	$ -	$ (3,254)
2	$ 60,195	4.09%	$ 2,462	$ 2,462	$ (1,952)	$ 4,414
3	$ 72,233	7.54%	$ 5,450	$ 4,434	$ 2,866	$ 1,568
4	$ 86,680	11.00%	$ 9,535	$ 7,151	$ 3,440	$ 3,711
5	$ 95,348	11.00%	$ 10,488	$ 7,866	$ 2,064	$ 5,802
6	$ 103,357	11.00%	$ 11,369	$ 8,527	$ 1,907	$ 6,620
7	$ 110,386	11.00%	$ 12,142	$ 9,107	$ 1,673	$ 7,433
8	$ 116,126	11.00%	$ 12,774	$ 9,580	$ 1,367	$ 8,214
9	$ 120,306	11.00%	$ 13,234	$ 9,925	$ 995	$ 8,930
10	$ 122,712	11.00%	$ 13,498	$ 10,124	$ 573	$ 9,551
Terminal year	$ 125,167	11.00%	$ 13,768	$ 10,326	$ 1,721	$ 8,605
The Value						
Terminal value			$ 172,104			
PV(Terminal value)			$ 85,215			
PV (CF over next 10 years)			$ 31,867			
Value of operating assets =			$ 117,082			
Adjustment for distress			$ 8,781		Probability of failure =	15.00%
- Debt & Mnority Interests			$ 28,371			
+ Cash & Other Non-operating assets			$ 10,886			
Value of equity			$ 90,816			
- Value of equity options			$ 153			
Number of shares			564.20			
Value per share			$ 160.69		Stock was trading at =	$132.40

Forecasting in the face of uncertainty. A test:

- 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%

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V. Price and Value

Pricing versus Valuation

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

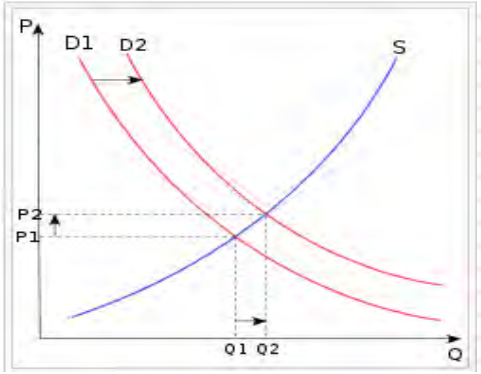
INTRINSIC VALUE

Value

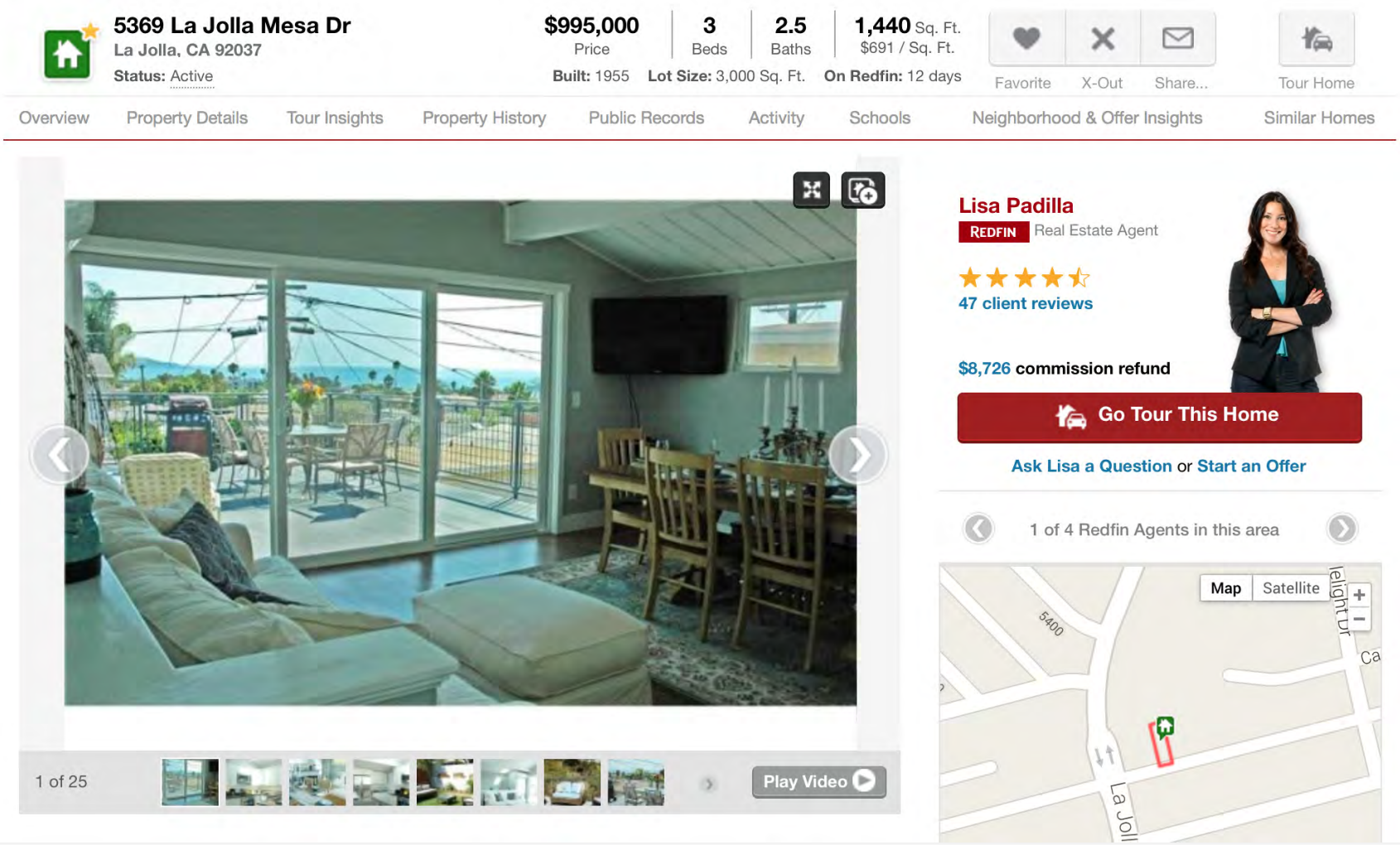
THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Price

PRICE



Test 1: Are you pricing or valuing?



Test 2: Are you pricing or valuing?

Europe
Switzerland

Biotechnology
Biotechnology

Reuters	Bloomberg	Exchange	Ticker
BION.S	BION SW	SWX	BION

Price at 12 Aug 2013 (CHF)	124.00
Price Target (CHF)	164.50
52-week range (CHF)	128.40 - 84.90

Strong sector and stock-picking continue

Impressive performance

Over the past two years, BB Biotech shares have roughly tripled, which could tempt investors to take profits. However, this performance has been well backed by a deserved revival of the biotech industry, encouraging fundamental news, M&A, and increased money flow into health care stocks. In addition, BBB returned to index outperformance by modifying its stock-picking approach. Hence, despite excellent performance, the shares still trade at a 23% discount to the net asset value of the portfolio. Hence, the shares are an attractive value vehicle to capture growth opportunities in an attractive sector.

Biotech industry remains attractive

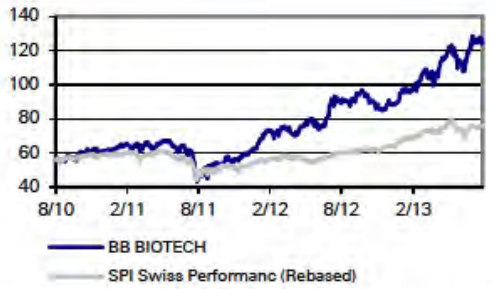
With the re-rating of the pharma sector, investors have also showed increased interest in biotech stocks. Established biotech stocks have delivered encouraging financial results and approvals, while there has also been substantial industry consolidation, which is not surprising in times of "cheap" money and high liquidity. BB Biotech remains an attractive vehicle to capture the future potential of the biotech sector. In addition, investors benefit from a 23% discount to NAV and attractive cash distribution policy of 5% yield p.a. Hence, we reiterate our Buy on BB Biotech shares

Key changes

Target Price	106.50 to 164.50	↑	54.5%

Source: Deutsche Bank

Price/price relative



Performance (%)	1m	3m	12m
Absolute	-1.4	5.4	37.4

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).

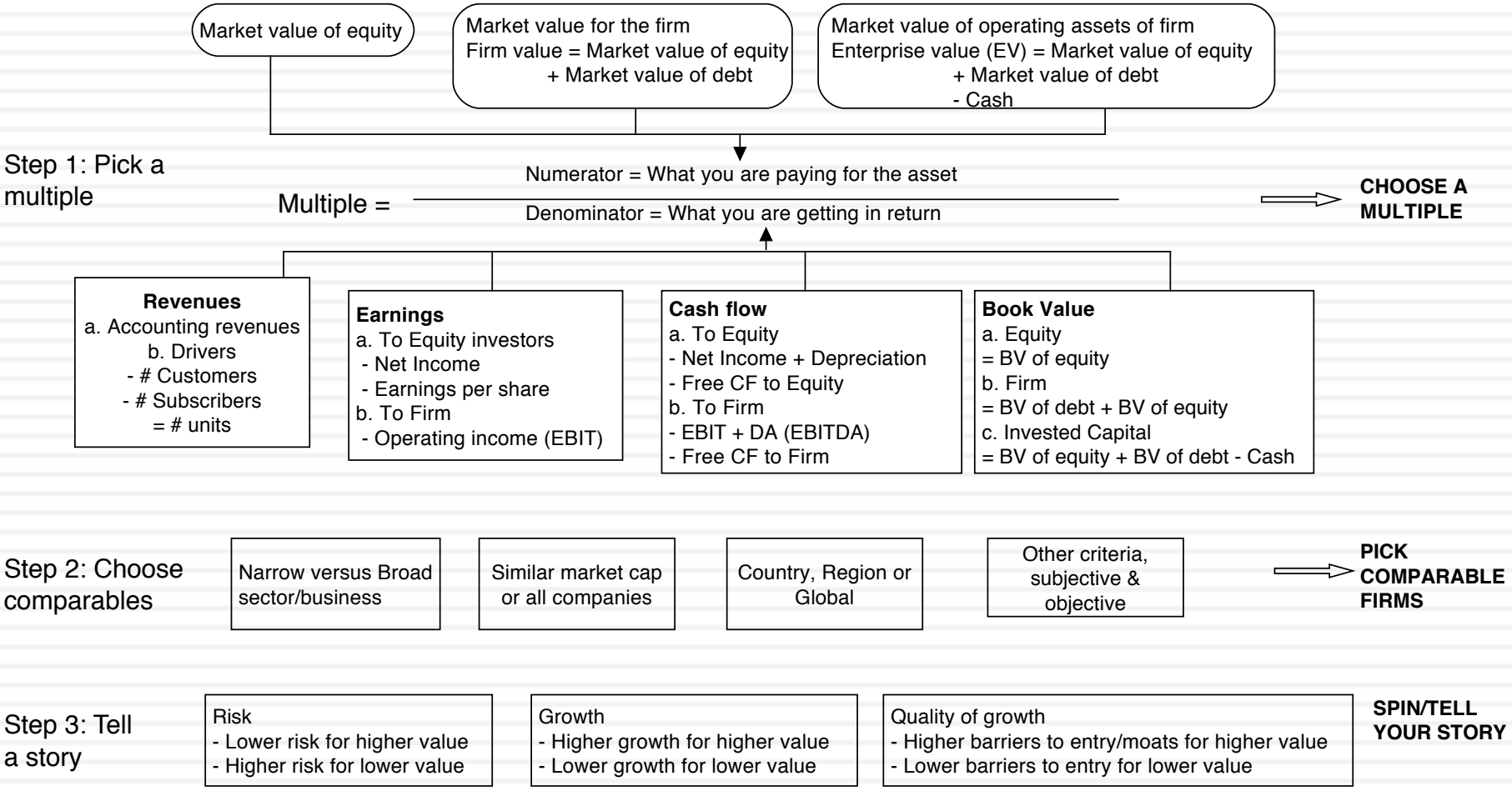
Liquidity & Trading Ease
While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

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".

Multiples and Comparable Transactions



To be a better pricer, here are four suggestions

- Check your multiple or consistency/uniformity
  - In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated
- Look at all the data, not just the key statistics
  - Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.
- Don't forget the fundamentals ultimately matter
  - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- Don't define comparables based only on sector
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

Classifying Investments

1. Cash flow generating assets: Generate cash flows now or are expected to do so in the future. Can be a fixed cash flow claim, a residual claim or a contingent claim.
2. Commodities: Used as raw material to meet another need (energy, food etc.).
3. Currencies: Measure of cash flows, medium of exchange or store of value.
4. Collectibles: May have aesthetic or emotional value but derives its pricing from its scarcity (supply) and the perception of others that it is wanted.

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.

Trading versus Investing

	The Pricing Game	The Value Game
Underlying philosophy	The price is the only real number that you can act on. No one knows what the value of an asset is and estimating it is of little use.	Every asset has a fair or true value. You can estimate that value, albeit with error, and price has to converge on value (eventually).
To play the game	You try to guess which direction the price will move in the next period(s) and trade ahead of the movement. To win the game, you have to be right more often than wrong about direction and to exit before the winds shift.	You try to estimate the value of an asset, and if it is under(over) value, you buy (sell) the asset. To win the game, you have to be right about value (for the most part) and the market price has to move to that value
Key drivers	Price is determined by demand & supply, which in turn are affected by mood and momentum.	Value is determined by cash flows, growth and risk.
Information effect	Incremental information (news, stories, rumors) that shifts the mood will move the price, even if it has no real consequences for long term value.	Only information that alter cash flows, growth and risk in a material way can affect value.
Tools of the game	(1) Technical indicators, (2) Price Charts (3) Investor Psychology	(1) Ratio analysis, (2) DCF Valuation (3) Accounting Research
Time horizon	Can be very short term (minutes) to mildly short term (weeks, months).	Long term
Key skill	Be able to gauge market mood/momentum shifts earlier than the rest of the market.	Be able to “value” assets, given uncertainty.
Key personality traits	(1) Market amnesia (2) Quick Actiing (3) Gambling Instincts	(1) Faith in “value” (2) Faith in markets (3) Patience (4) Immunity from peer pressure
Biggest Danger(s)	Momentum shifts can occur quickly, wiping out months of profits in a few hours.	The price may not converge on value, even if your value is “right”.
Added bonus	Capacity to move prices (with lots of money and lots of followers).	Can provide the catalyst that can move price to value.
Most Delusional Player	A trader who thinks he is trading based on value.	A value investor who thinks he can reason with markets.

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".

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:

  EV/ Sales = 0.924 + 12.93 Operating Margin R^2 = 44.5%

  (2.82) (8.74)
- Plugging in Infosys operating margin (24.29%) into the regression, we get:

  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.

Pricing Twitter: Start with the "comparables"

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

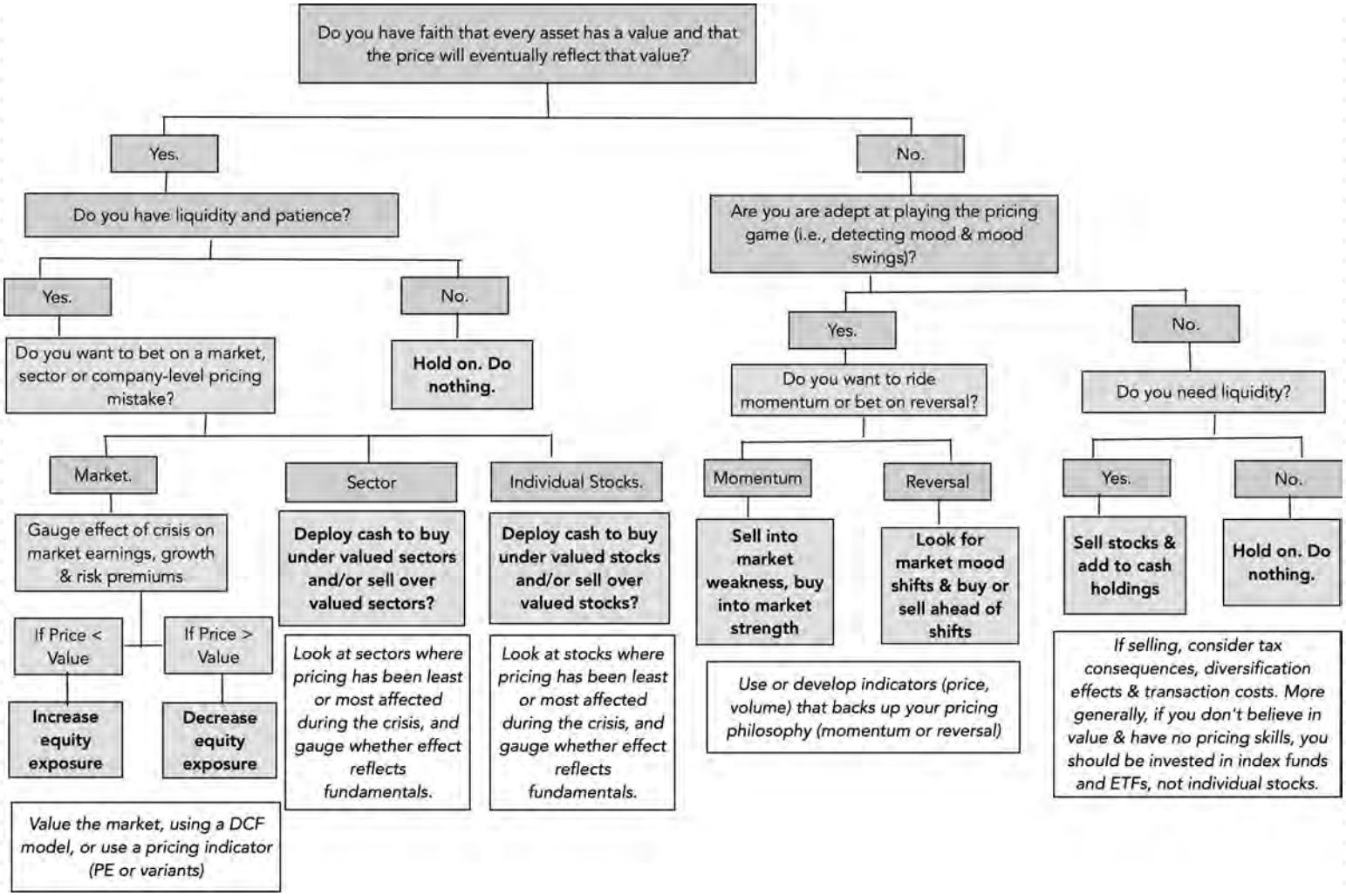
	Market Cap	Enterprise value	Revenues	EBITDA	Net Income	Number of users (millions)
Market Cap	1.					
Enterprise value	0.9998	1.				
Revenues	0.8933	0.8966	1.			
EBITDA	0.9709	0.9701	0.8869	1.		
Net Income	0.8978	0.8971	0.8466	0.9716	1.	
Number of users (millions)	0.9812	0.9789	0.8053	0.9354	0.8453	1.

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”

- 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

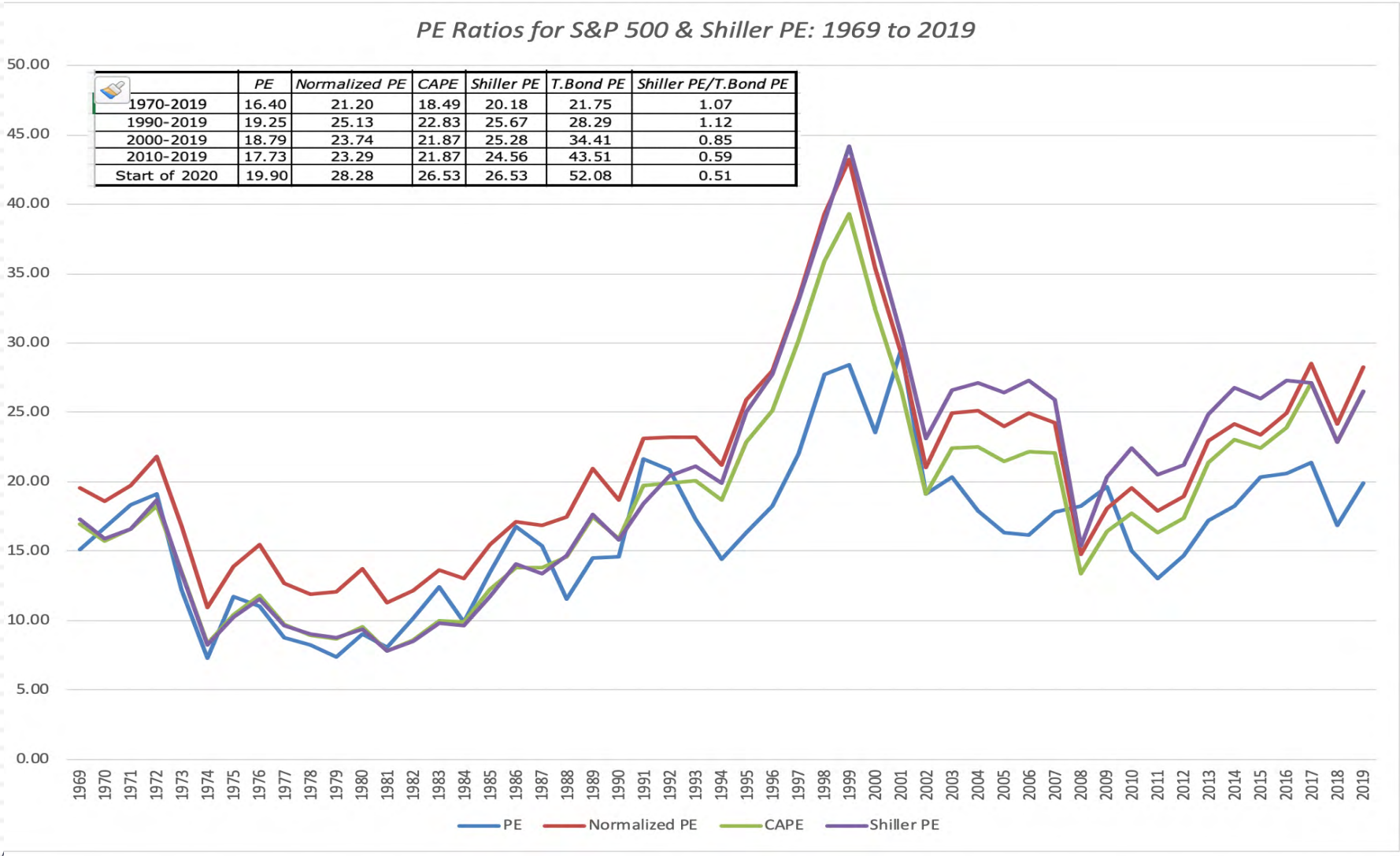
A Crisis Plan: Trader or Investor?



A Pricing Market?

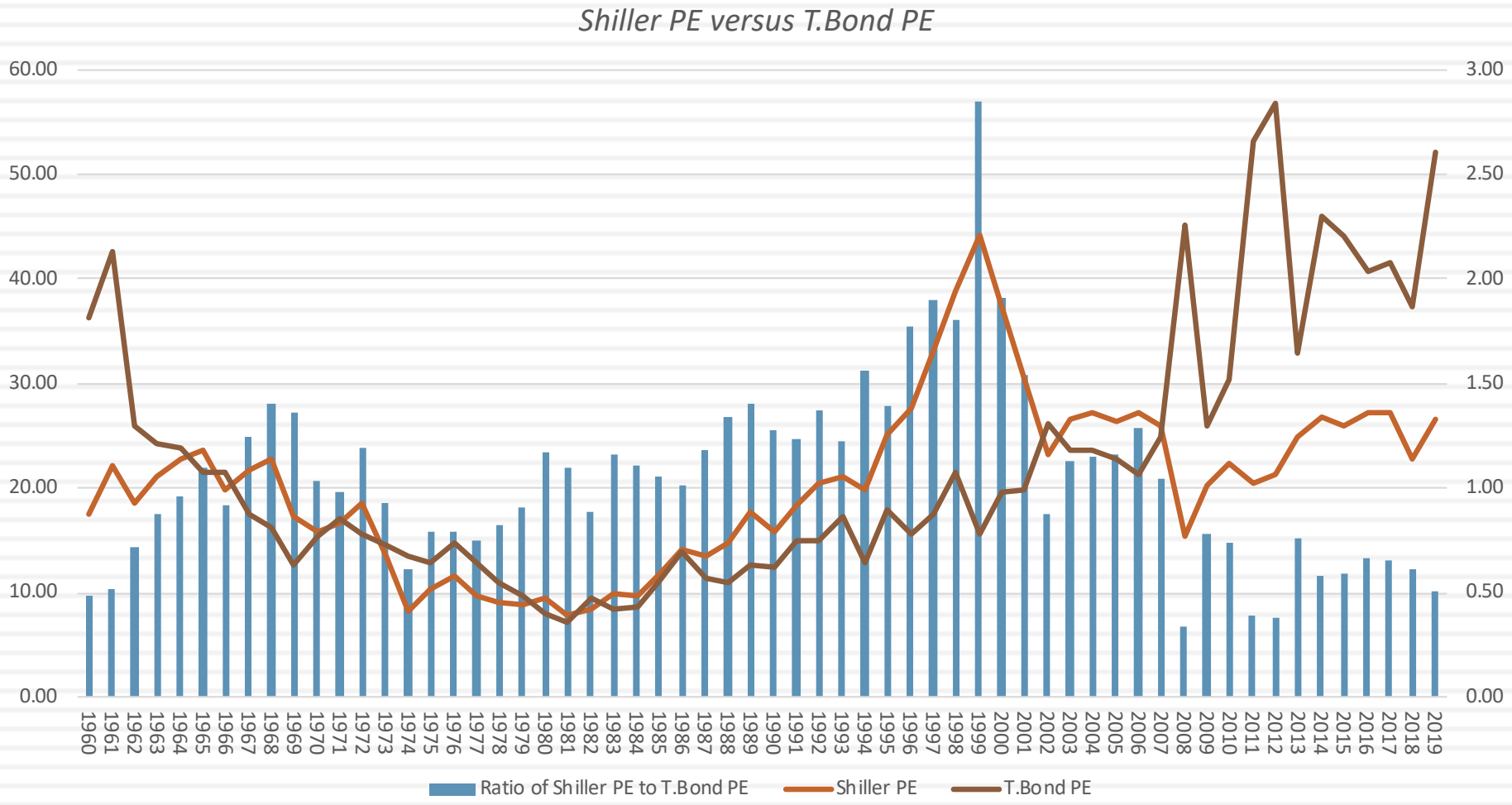
- I have argued that just because uncertainty has increased, there is no excuse for abandoning valuation first principles or process and argued that you can still value companies, albeit with a much wider range of outcomes.
- One common counter that I got to this argument was that valuation was pointless, when the uncertainty was so great and while most did not bother presenting alternatives, my guess is that many will fall back on pricing metrics to decide whether and what to buy or sell.
- Put simply, they will use a PE ratio or an enterprise value multiple of EBITDA or sales to decide what stocks to buy or sell, acting under the delusion that this will allow them to escape having to make assumptions in the future.

Pricing a Market: The S&P 500 at the start of 2020

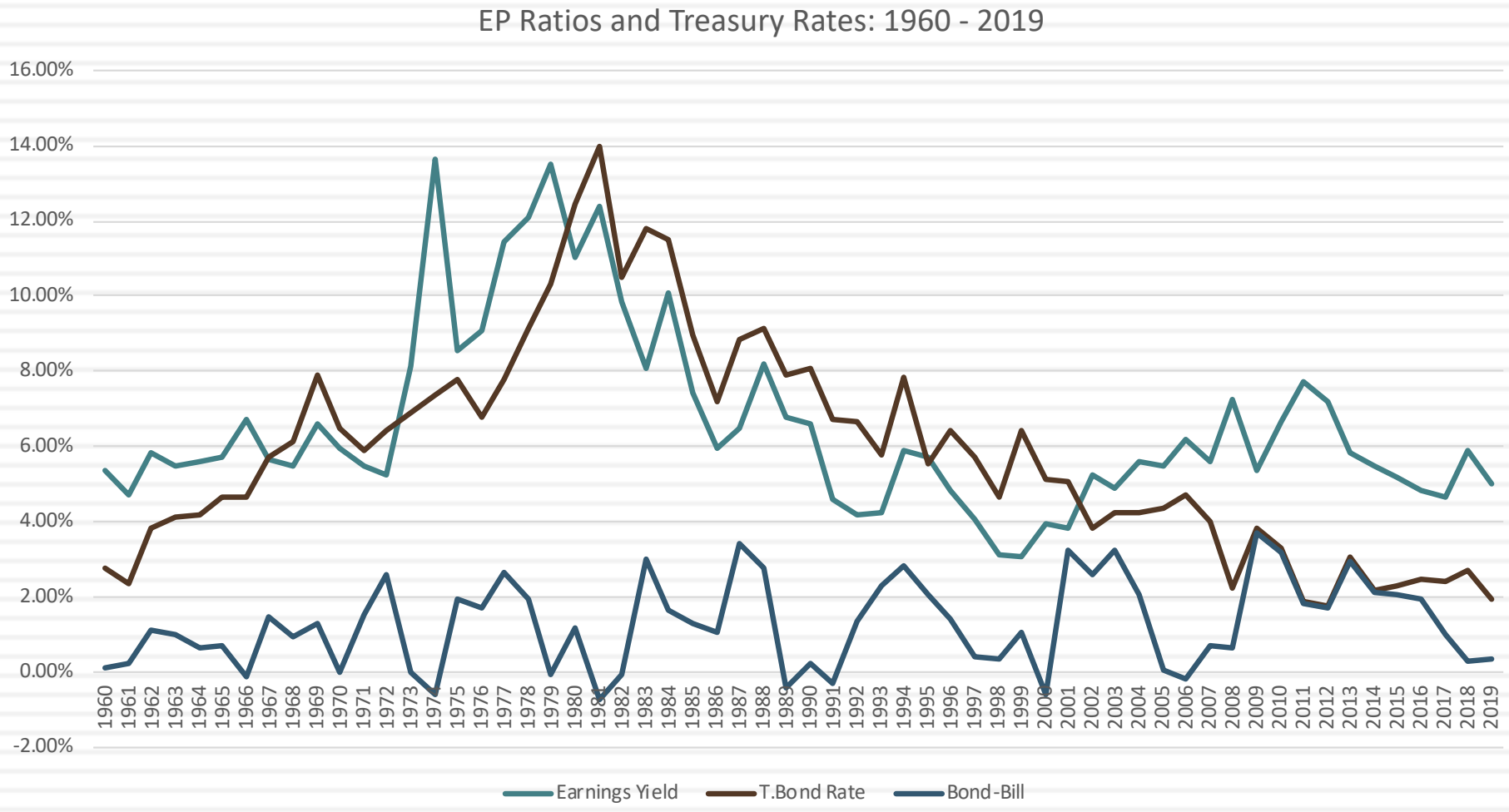


	PE	Normalized PE	CAPE	Shiller PE	T.Bond PE	Shiller PE/T.Bond PE
1970-2019	16.40	21.20	18.49	20.18	21.75	1.07
1990-2019	19.25	25.13	22.83	25.67	28.29	1.12
2000-2019	18.79	23.74	21.87	25.28	34.41	0.85
2010-2019	17.73	23.29	21.87	24.56	43.51	0.59
Start of 2020	19.90	28.28	26.53	26.53	52.08	0.51

Bringing in the alternatives…



The Tie Breaker: E/P Ratios , T.Bond Rates and Term Structure: Updated..



Regression Results

	EP	T.Bond	T.Bill
EP	1.0000		
T.Bond	0.6214	1.0000	
Bond - Bill	-0.1283	-0.0739	1.0000

Correlation between E/P and interest rates

- In the following regression, using 1960-2019 data, we regress E/P ratios against the level of T.Bond rates and a term structure variable (T.Bond - T.Bill rate)

  EP Ratio = 0.0373 + 0.5222 T.Bond Rate - 0.1718 (T.Bond Rate - T.Bill Rate)
  (5.71) (5.95) (-0.80)

  R squared = 39.29%

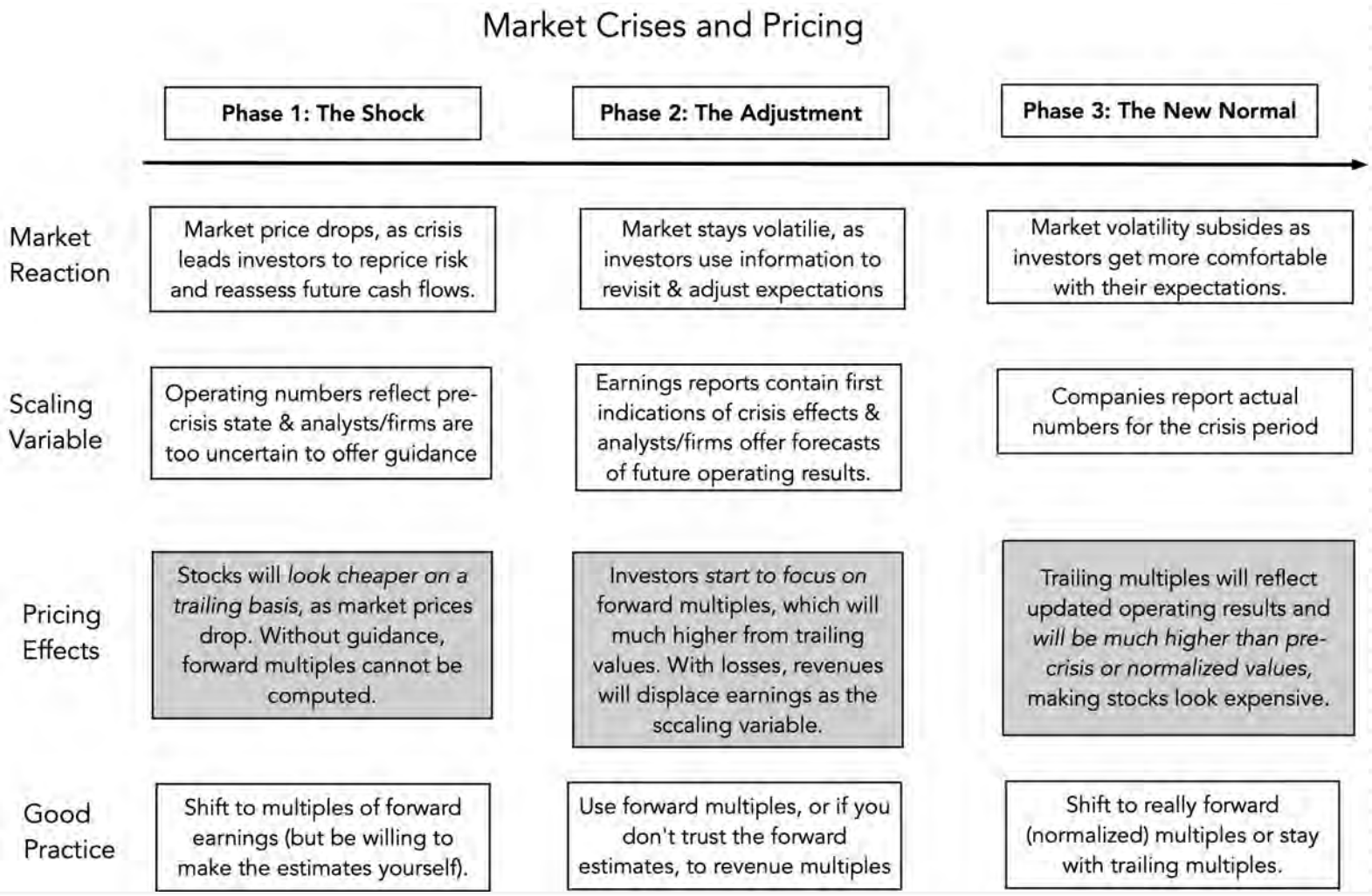
- Going back to 2008, this is what the regression looked like:

  E/P = 2.56% + 0.7044 T.Bond Rate – 0.3289 (T.Bond Rate-T.Bill Rate)
  (4.71) (7.10) (1.46)

  R squared = 50.71%

  The R-squared has dropped and the differential with the T.Bill rate has lost significance. How would you read this result?

The Timing Effect: Pricing in a Crisis



Regional Pricing: The COVID effect

	Market Capitalization		Trailing Net Income		Trailing PE		Enterprise Value		Trailing Revenues		EV/Sales	
Sub Region	1/1/20	4/17/20	LTM thru 1/1/20	LTM thru 4/17/20	1/1/20	4/17/20	1/1/20	4/17/20	LTM thru 1/1/20	LTM thru 4/17/20	1/1/20	4/17/20
Africa	$ 602,927	$ 381,099	$ 35,530	$ 38,724	16.97	9.84	$ 598,016	$ 386,863	$ 385,783	$ 429,492	1.55	0.90
Australia & NZ	$ 1,587,941	$ 1,193,976	$ 76,536	$ 70,092	20.75	17.03	$ 2,052,175	$ 1,770,472	$ 683,728	$ 732,201	3.00	2.42
Canada	$ 2,167,437	$ 1,690,178	$ 94,098	$ 110,956	23.03	15.23	$ 1,930,814	$ 1,695,978	$ 1,242,344	$ 1,353,786	1.55	1.25
China	$ 13,922,636	$ 13,253,719	$ 772,575	$ 828,606	18.02	16.00	$ 15,945,308	$ 15,957,070	$ 9,302,106	$ 9,967,255	1.71	1.60
Eastern Europe & Russia	$ 826,177	$ 580,852	$ 111,656	$ 131,695	7.40	4.41	$ 916,769	$ 707,384	$ 819,619	$ 913,013	1.12	0.77
EU & Environs	$ 13,542,156	$ 10,757,788	$ 715,323	$ 744,298	18.93	14.45	$ 16,890,750	$ 14,809,760	$ 10,766,716	$ 11,241,700	1.57	1.32
India	$ 2,168,366	$ 1,602,062	$ 51,119	$ 53,477	42.42	29.96	$ 2,947,357	$ 2,351,699	$ 821,927	$ 1,292,910	3.59	1.82
Japan	$ 6,156,869	$ 5,232,948	$ 414,961	$ 358,188	14.84	14.61	$ 6,256,725	$ 5,693,556	$ 7,446,882	$ 7,673,662	0.84	0.74
Latin America & Caribbean	$ 2,422,143	$ 1,527,171	$ 134,160	$ 134,678	18.05	11.34	$ 3,860,250	$ 2,671,959	$ 1,578,743	$ 1,628,911	2.45	1.64
Middle East	$ 3,211,880	$ 2,665,047	$ 189,723	$ 166,013	16.93	16.05	$ 3,176,350	$ 2,763,122	$ 939,171	$ 939,350	3.38	2.94
Small Asia	$ 5,195,524	$ 4,175,157	$ 328,180	$ 273,916	15.83	15.24	$ 5,360,207	$ 4,728,309	$ 4,990,894	$ 5,069,035	1.07	0.93
UK	$ 3,131,108	$ 2,298,374	$ 140,987	$ 136,642	22.21	16.82	$ 2,943,496	$ 2,464,666	$ 2,086,704	$ 2,387,791	1.41	1.03
United States	$ 34,066,742	$ 29,784,527	$ 1,326,457	$ 1,330,281	25.68	22.39	$ 43,454,615	$ 41,102,137	$ 15,594,487	$ 16,315,385	2.79	2.52
Global	$ 89,001,908	$ 75,142,899	$ 4,391,305	$ 4,377,566	20.27	17.17	$ 106,332,834	$ 97,102,977	$ 56,659,105	$ 59,944,491	1.88	1.62

Sector Pricing: A COVID update

	Market Capitalization		Trailing Net Income		Trailing PE		Enterprise Value		Trailing Revenues		EV/Sales	
Primary Sector	1/1/20	4/17/20	LTM thru 1/1/20	LTM thru 4/17/20	1/1/20	4/17/20	1/1/20	4/17/20	LTM thru 1/1/20	LTM thru 4/17/20	1/1/20	4/17/20
Communication Services	$ 7,061,144	$ 6,396,994	$ 272,240	$ 268,340	25.94	23.84	$ 8,394,815	$ 8,204,313	$ 3,075,462	$ 3,275,528	2.73	2.50
Consumer Discretionary	$ 10,001,063	$ 8,555,018	$ 400,379	$ 422,756	24.98	20.24	$ 11,670,561	$ 10,923,729	$ 8,521,352	$ 8,837,248	1.37	1.24
Consumer Staples	$ 7,119,228	$ 6,548,231	$ 253,891	$ 252,124	28.04	25.97	$ 8,249,126	$ 7,914,722	$ 5,338,559	$ 5,590,613	1.55	1.42
Energy	$ 6,451,348	$ 4,383,093	$ 432,428	$ 324,381	14.92	13.51	$ 7,947,389	$ 6,218,676	$ 6,101,367	$ 6,159,010	1.30	1.01
Financials	$ 15,098,560	$ 10,933,915	$ 1,176,914	$ 1,389,056	12.83	7.87	$ 17,472,728	$ 14,789,327	$ 7,181,276	$ 8,270,695	2.43	1.79
Global	$ 89,001,908	$ 75,142,899	$ 4,391,305	$ 4,377,566	20.27	17.17	$ 106,332,834	$ 97,102,977	$ 56,659,105	$ 59,944,491	1.88	1.62
Health Care	$ 8,632,427	$ 8,581,301	$ 187,642	$ 218,959	46.00	39.19	$ 9,283,692	$ 9,527,167	$ 3,427,878	$ 3,884,560	2.71	2.45
Industrials	$ 10,017,689	$ 7,951,424	$ 492,859	$ 450,654	20.33	17.64	$ 12,471,645	$ 11,013,498	$ 9,882,375	$ 10,347,296	1.26	1.06
Information Technology	$ 12,471,842	$ 11,798,990	$ 436,974	$ 404,289	28.54	29.18	$ 12,549,738	$ 12,140,677	$ 4,716,370	$ 4,860,140	2.66	2.50
Materials	$ 5,122,449	$ 4,139,741	$ 328,775	$ 220,595	15.58	18.77	$ 6,455,495	$ 5,541,436	$ 4,727,861	$ 4,787,420	1.37	1.16
Real Estate	$ 3,953,469	$ 3,164,030	$ 271,496	$ 255,331	14.56	12.39	$ 6,549,674	$ 5,752,049	$ 1,445,509	$ 1,618,764	4.53	3.55
Utilities	$ 3,071,852	$ 2,689,435	$ 137,701	$ 171,080	22.31	15.72	$ 5,287,148	$ 5,076,670	$ 2,241,086	$ 2,313,215	2.36	2.19
All firms	$ 89,001,908	$ 75,142,899	$ 4,391,305	$ 4,377,566	20.27	17.17	$ 106,332,834	$ 97,102,977	$ 56,659,105	$ 59,944,491	1.88	1.62

Pricing: A Wrap

- As companies start to report their first quarter earnings, you are starting to get a glimpse of the damage created by the crisis and my guess is that you will start to see more analysts and companies start to forecast forward numbers.
  - For those companies where forward earnings are positive, you can switch to forward PE ratios, but expect these numbers to be much, much higher than historical norms.
  - For those companies that have negative forward earnings, you will see revenue multiples or creative variations on future earnings.
- Later this year, as companies report numbers for the second and third quarters of 2020, the trailing operating numbers will finally catch up with the crisis, and you may be able to shift back to trailing multiples.
- Put simply, if you are abandoning or refusing to do intrinsic valuation, because you feel uncomfortable with having to make assumptions, the same uncertainty is going to pervade your pricing as well.

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VI. Honing your craft…

Back to valuation as a craft…

- If you accept my characterization of valuation as a craft, you have to also accept the reality that you can never master it.
- You have to work at improving your craftsmanship and leaving the door open to changing how you think about almost every concept that you use.
- Put simply, you have to be willing to say "I was wrong" and start over.

Uber

Uber: Personal Mobility Player?

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

The Assumptions

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

The Cash Flows

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

The Value

Terminal value	$	114,108
PV(Terminal value)	$	46,258
PV (CF over next 10 years)	$	501
Value of operating assets =	$	46,759
Probability of failure		5%
Value in case of failure	$	-
Adjusted Value for operating assets	$	44,421
+ Cash on hand	$	6,406
+ Cross holdings	$	8,700
+ IPO Proceeds	$	9,000
- Debt	$	6,869
Value of equity	$	61,658
Value per share	$	27.67

Push back on Uber Valuation

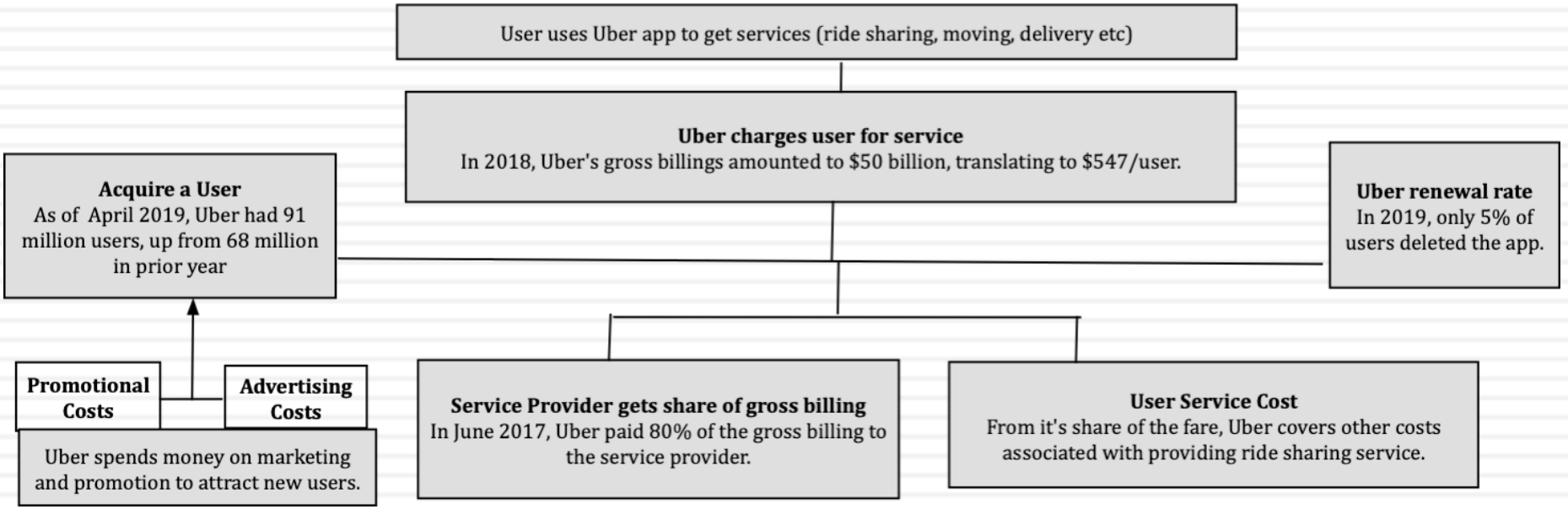
- Input disagreement: Lots of inputs and assumptions and I could be wrong on any or all of them..
- Model debate: DCF was designed for old economy companies and not suited to new economy firms that are more focused on accumulating users & subscribers, making them stick with the firm and sell them products & services over long periods.
- DCF is flexible: DCF models are much more flexible than most people give them credit for, and that they can be modified to reflect other frameworks. If you have a problem with a DCF value, it should not be with the model but with the person using that model.

User/ Subscriber/Member Based Valuation

- A user, subscriber or member has value only because he/she generates revenues for the company. The key to valuing a unit then becomes identifying the link to cash flows and value.
- To **value users**, you have to value an individual user first and then estimate the cost of acquiring new users.
  - The value of an existing user is the present value of the expected cash flows that you will generate from that user, over the lifetime that he or she remains a user.
  - The value of a new user will be the value of a user, net of the cost of acquiring a user.
  - The aggregate value of users will be the sum of the values of existing and new users.
- To get to the **value of a company**, you have to net out the other centralized/non-user specific costs that it will face.

Uber User Economics

Figure 4: The Mechanics of Uber's Business



Uber's Income Statement (from Prospectus)

	Year Ended December 31,		
	2016	2017	2018
Revenue	$ 3,845	$ 7,932	$ 11,270
Costs and expenses			
Cost of revenue, exclusive of depreciation and amortization shown separately below	2,228	4,160	5,623
Operations and support	881	1,354	1,516
Sales and marketing	1,594	2,524	3,151
Research and development	864	1,201	1,505
General and administrative	981	2,263	2,082
Depreciation and amortization	320	510	426
Total costs and expenses	6,868	12,012	14,303

Uber: Deconstructing the Financials

Costs of Servicing Existing Users

Year	*Gross Billings*	*Net Revenue*	*Operating Expenses*	*Net Revenue/Gross Billings*	*Operating Expense/Net Revenue*
2016	$ 19,236.00	$ 3,219.00	$ 3,109.00	16.73%	96.58%
2017	$ 34,409.00	$ 7,191.00	$ 5,514.00	20.90%	76.68%
2018	$ 49,799.00	$ 10,025.00	$ 7,139.00	20.13%	71.21%

Costs of Adding New Users

Year	# Users added	Selling Expenses	Cost/New user
2016	21	1594	$ 75.90
2017	23	2524	$ 109.74
2018	23	3151	$ 137.00

Corporate Expenses

Year	R&D	G&A	Depreciation	Total	As % of Net Revenue
2016	$ 864.00	$ 981.00	$ 320.00	$ 2,165.00	67.26%
2017	$ 1,201.00	$ 2,263.00	$ 510.00	$ 3,974.00	55.26%
2018	$ 1,505.00	$ 2,082.00	$ 426.00	$ 4,013.00	40.03%

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

	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**										

Beyond year 10
User growth continues at 2.5% a year

Uber Corporate Expense Value (Drag)

Base Year Expenses
From Prospectus for 2018

Growth rate of 7%
Economies of scale

Tax Rate
Assumed =25%

Cost of capital
Used 8.24%, median US company cost of capital

	Base Year	1	2	3	4	5	6	7	8	9	10
Corporate Expenses	-$3,330.93	-$3,564.10	-$3,813.59	-$4,080.54	-$4,366.17	-$4,671.81	-$4,998.83	-$5,348.75	-$5,723.16	-$6,123.78	-$6,552.45
After-tax Corporate Expenses		$ (2,673.07)	$ (2,860.19)	$ (3,060.40)	$ (3,274.63)	$ (3,503.85)	$ (3,749.12)	$ (4,011.56)	$ (4,292.37)	$ (4,592.84)	$ (4,914.34)
Terminal Value (Corporate Exp)											$ (87,756.02)
PV of Corporate Expenses		-$2,469.58	-$2,441.29	-$2,413.32	-$2,385.67	-$2,358.34	-$2,331.33	-$2,304.62	-$2,278.22	-$2,252.12	-$41,981.99
Value Drag of Corporate Expenses	**-$63,216.48**										

Uber Valuation

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 expenses are mostly variable, 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	**$**	**58,614.37**
# Shares		2235.26
Value/Share	**$**	**26.22**

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VII. The Illusion of Smart Money

The Myth of smart money

- In investing mythology, there are smart investors and stupid investors.
  - Smart investors sense when markets are going to turn, and get in sooner than others, and get out sooner than others. After every crisis, there are a few who are anointed as gurus. They are also much better at picking the right stocks to buy and sell
  - Stupid investors are uninformed, act on emotion, and panic quickly.
- In this mythology, professional money managers and talking heads on financial TV land are smart investors. Hedge fund investors are really, really smart and retail investors are stupid investors.

The Basis for the Myth

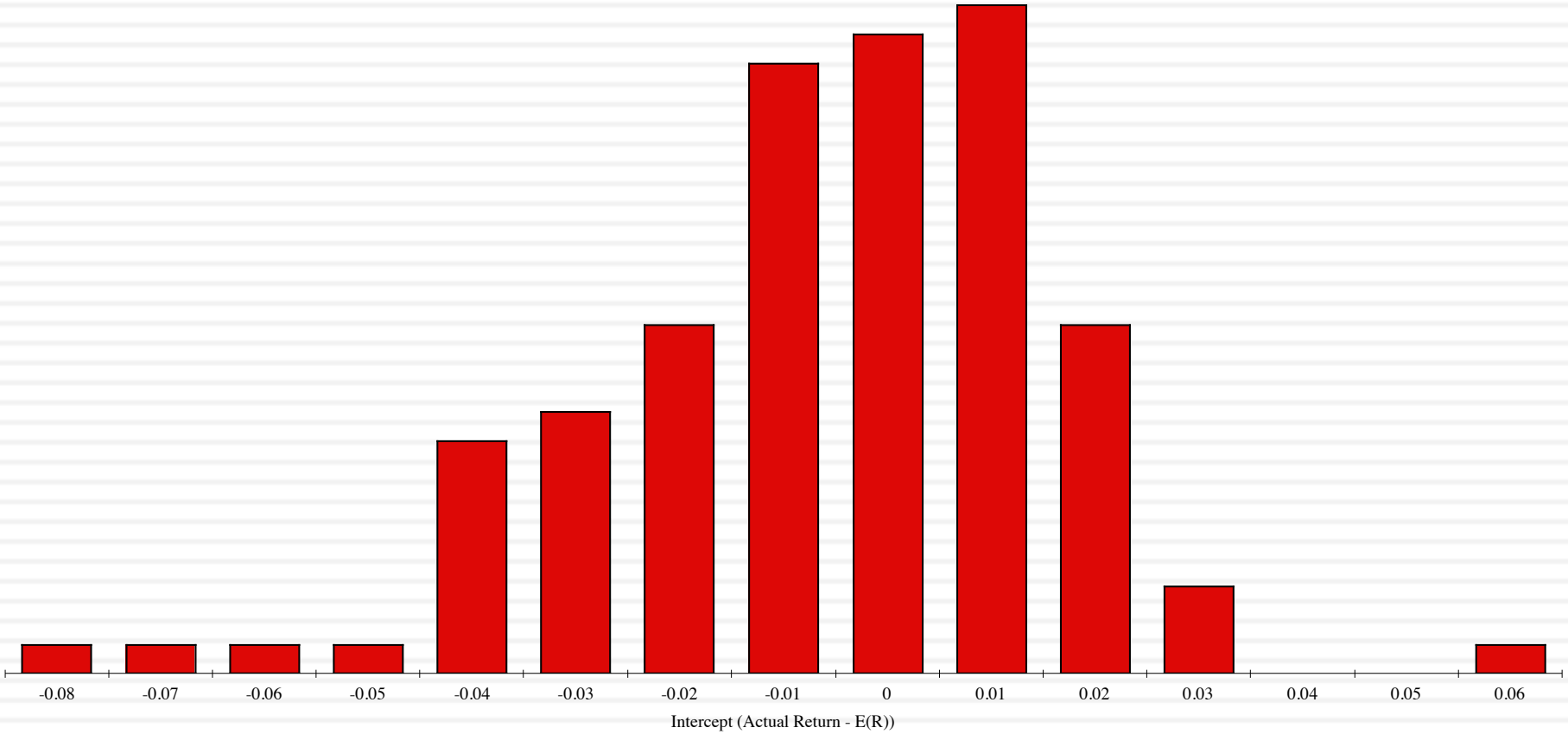
- Anecdotal evidence: Over time, we have all read about great investors who have beaten the market. In fact, Warren Buffet alone probably has a library of books testifying to his greatness.
- Self Promotion: Almost every money manager seeking your money bases it on a track record, real or invented, of beating the market.
- Academia: In the last fifty years, academics in finance have filled journals with articles on how easy it is to beat the market, using public information (from market cap to PE to PBV to pure momentum).

The Big Question: Active vs Passive

- In passive investing, as an investor, you allocate your wealth across asset classes (equities, bonds, real assets) based upon your risk aversion, liquidity needs and time horizon, and within each class, rather than pick individual stocks, bonds or real assets, you invest in index funds or exchange traded funds (ETFs) to cover the spectrum of choices.
- In active investing, you try to time markets (by allocating more money to asset classes that you believe are under valued and less to those that you think are over valued) or pick individual assets that you believe offer the potential for higher returns.
- Active investing covers a whole range of different philosophies from day trading to buying entire companies and holding them for the long term.

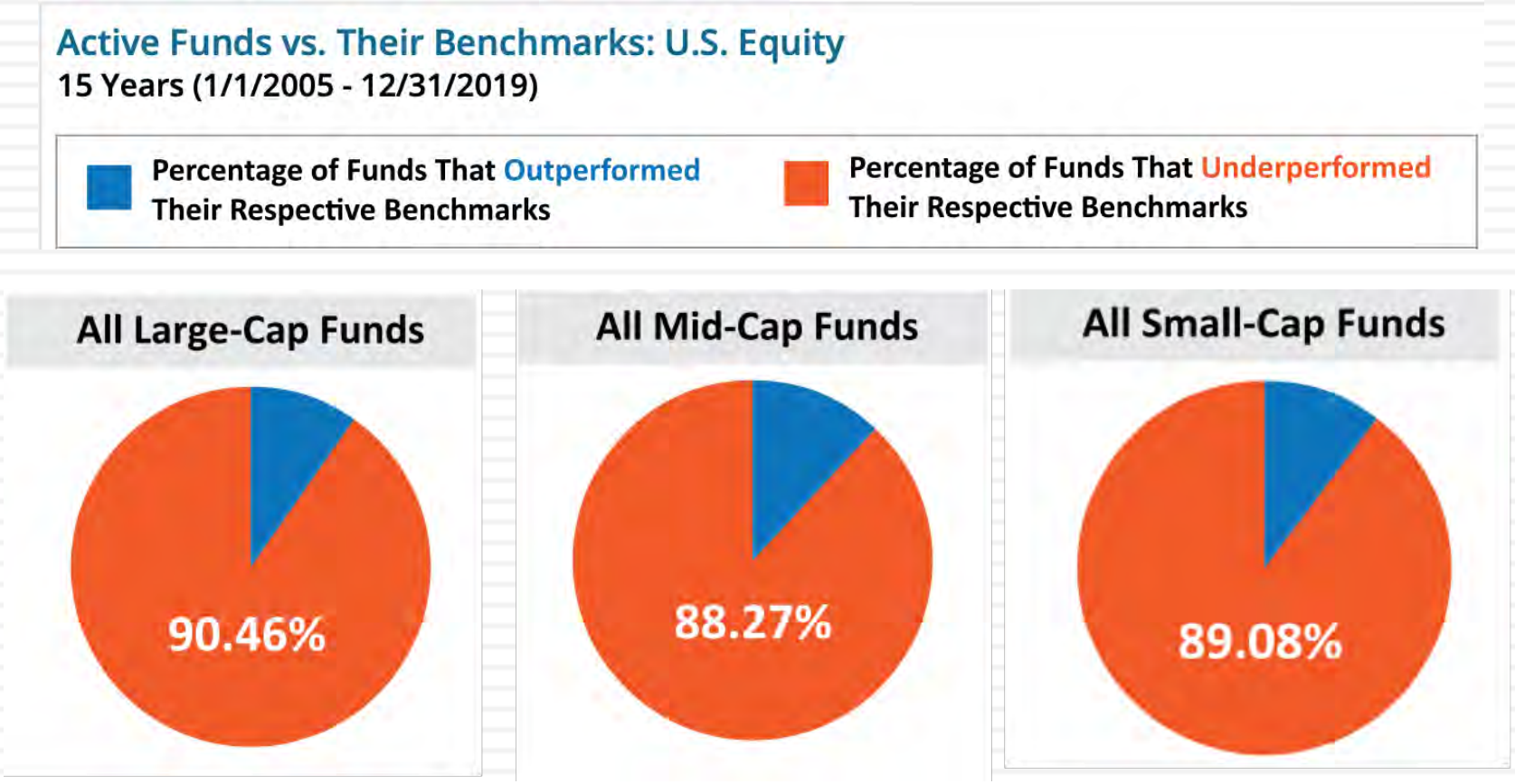
The Original Skeptic: The Jensen Study of Mutual funds in 1968

Figure 13.3: Mutual Fund Performance: 1955-64 - The Jensen Study

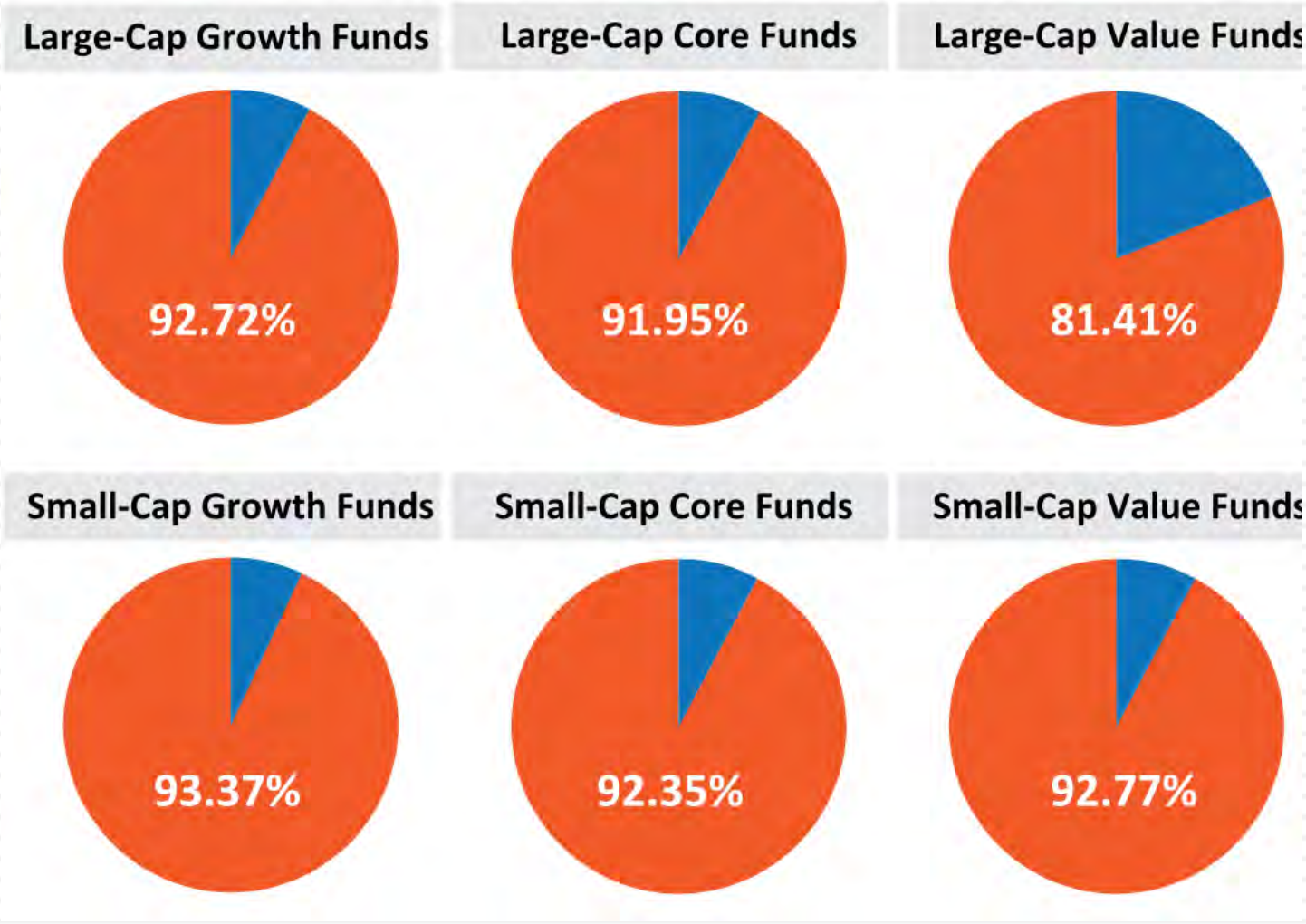


In 1968, the median mutual fund manager made about 1.5% less than the market, after adjusting for risk.

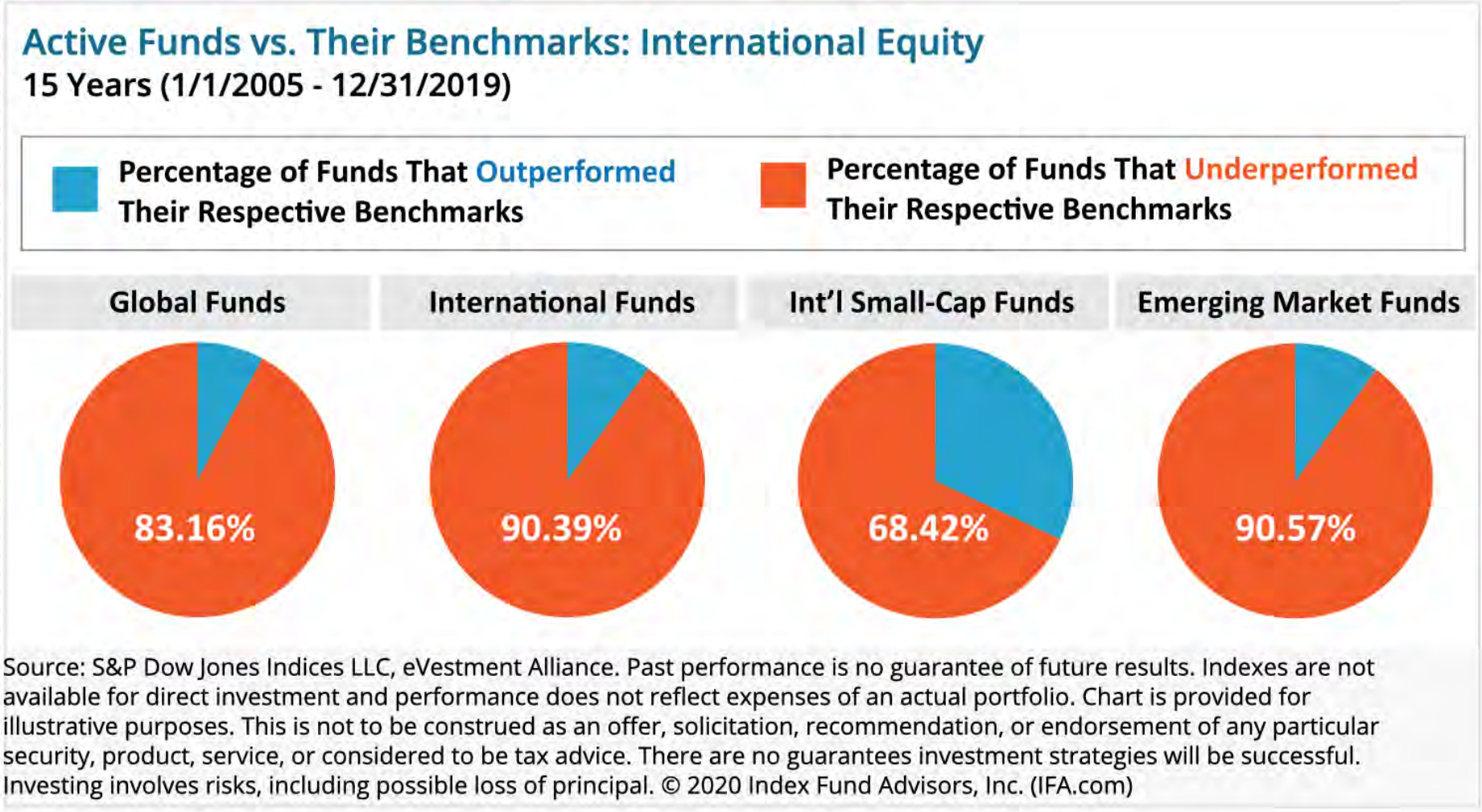
1. Categorized by market cap of companies



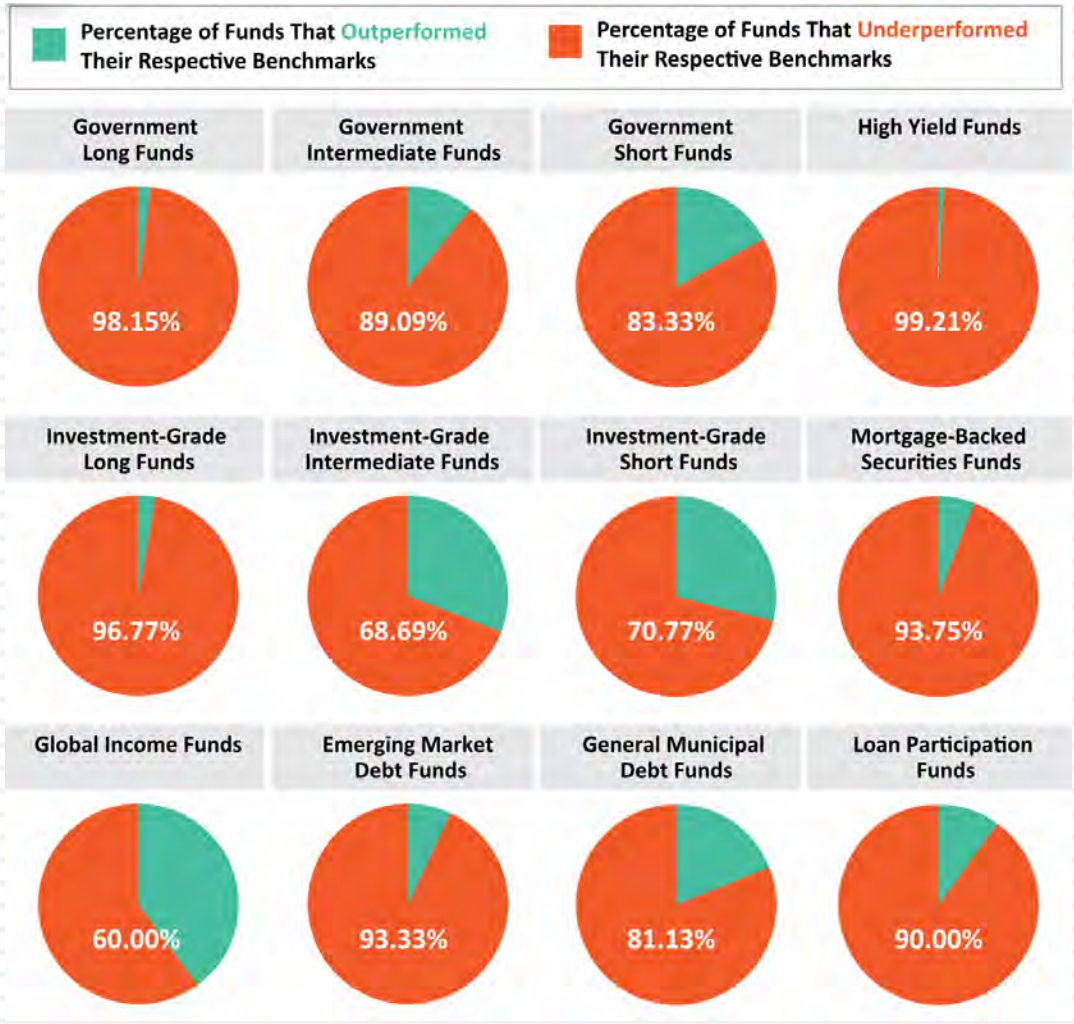
2. Categorized by Investment Style



3. Emerging Market and International Funds



4. It’s not just stocks



There is no consistency.. Winners don't stay winners for long

If there is consistency in performance, funds in a specific quartile should be more likely to stay in that quartile than move to another. The shaded numbers on the diagonal should all be much higher than 25%.

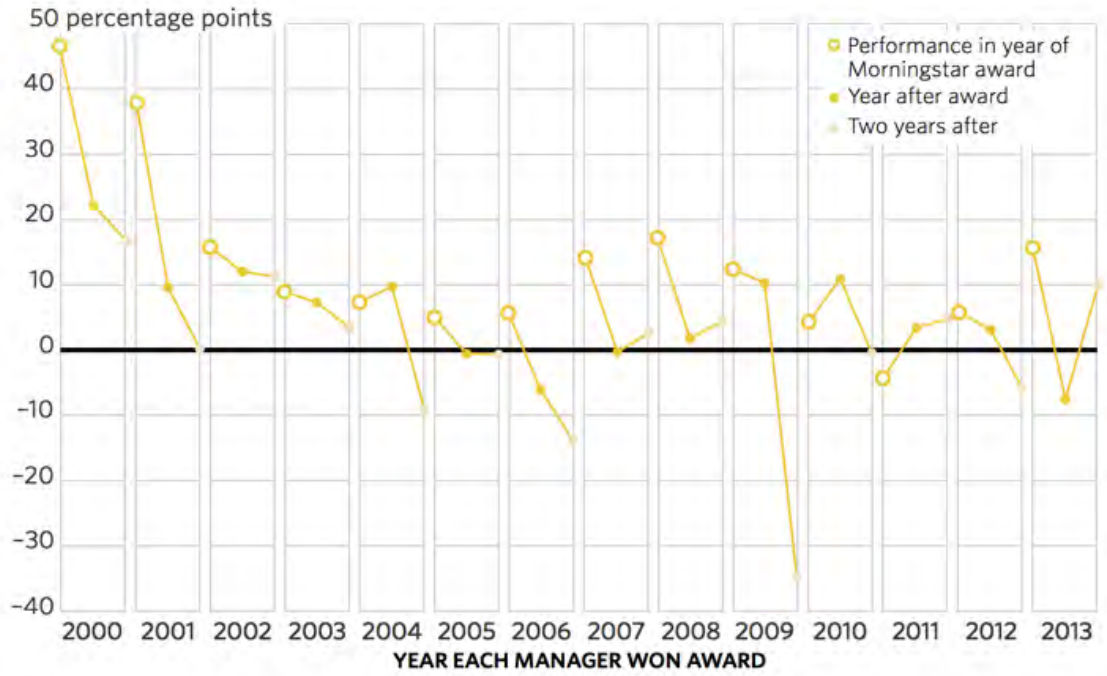
A top performing fund in the last year is more likely to become among the worst perfoming in the next few periods, than stay top performing.

		Following three year period				
		Quartile 1	Quartile 2	Quartile 3	Quartile 4	Merged/Liquidated
Last year	Quartile 1	16.53%	21.42%	25.80%	29.51%	6.75%
	Quartile 2	27.10%	23.06%	21.89%	19.19%	8.75%
	Quartile 3	26.31%	21.92%	19.90%	16.02%	15.85%
	Quartile 4	15.18%	18.72%	17.37%	20.40%	28.33%

A large percentage of the worst performing funds fail or are merged, creating a strong survivor bias. Consequently, any study that looks at the returns on only those funds that survived is likely to overstate the returns earned by actively managed funds.

And super star managers fade quickly..

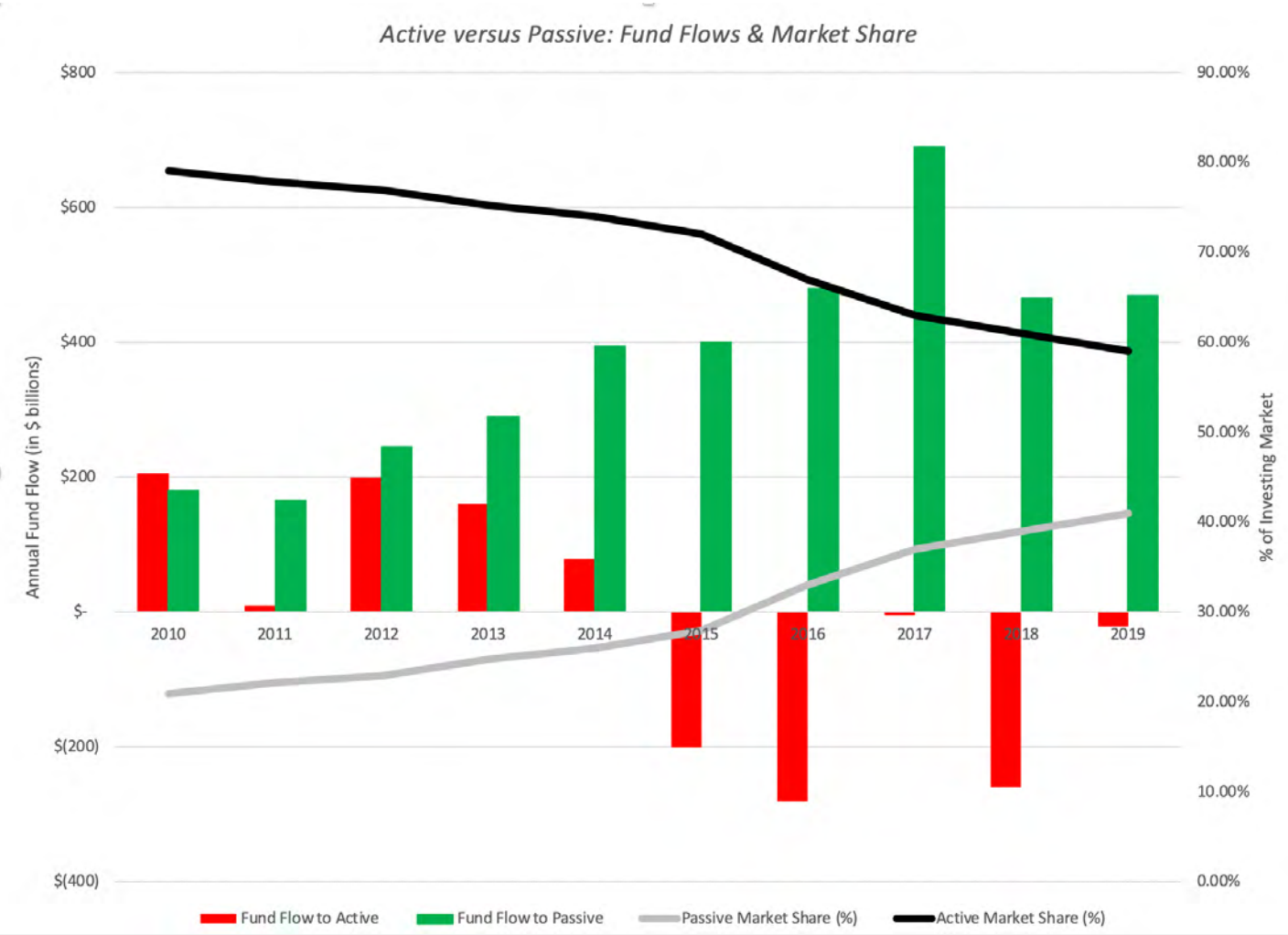
Managers named by Morningstar as top performers for a given year generally didn't perform as well relative to the S&P 500 in subsequent years.



Note: Performance of Morningstar Domestic Stock Fund Manager of the Year, relative to annual total return of the S&P 500. Analysis uses largest fund if manager helmed multiple funds.

Source: Morningstar

A Not Surprising Consequence: Its been a passive investing decade



The Active Investing Counter

- During the last decade, as active investors have lost ground to passive investing vehicles, active money managers argued that we would all see their worth if you entered a crisis.
  - The active market timers were arguing that their expertise would allow them to get you out of stocks before a crisis hit, and back into stocks at the right time.
  - The stock pickers contended that they would pick stocks that were less affected by the crisis, as stocks fell, and move you into stocks that would benefit as stocks came back.
- The COVID crisis has given active investing a chance. Let's see how it has measured up.

The Crisis Test: Active Mutual Funds

	Returns in 2020, First Quarter		
Equity Mutual Funds	*Mutual Funds*	*MS Index*	*Active Excess Return*
Large Blend	-20.92%	-17.86%	-3.06%
Large Growth	-15.48%	-11.51%	-3.97%
Large Value	-26.77%	-25.10%	-1.67%
Mid-Cap Blend	-28.28%	-26.42%	-1.86%
Mid-Cap Growth	-20.64%	-17.00%	-3.64%
Mid-Cap Value	-32.53%	-35.52%	2.99%
Small Blend	-32.37%	-31.61%	-0.76%
Small Growth	-24.59%	-21.45%	-3.14%
Small Value	-36.89%	-39.68%	2.79%
All US Equity Funds	-21.94%	-20.57%	-1.37%

Exhibit 1: Percentage of U.S. Equity Funds Outperformed by Benchmarks

FUND CATEGORY	COMPARISON INDEX	JAN.-APRIL 2020 (%)	Q1 2020 (%)	Q4 2019-Q1 2020 (%)	1-YEAR (%)	3-YEAR (%)	5-YEAR (%)	10-YEAR (%)	15-YEAR (%)
All Domestic Funds	S&P Composite 1500	64.3	62.4	67.2	71.5	72.5	83.1	87.3	88.4
All Large-Cap Funds	S&P 500	58.7	54.4	58.4	61.0	69.6	79.0	85.6	87.7
All Mid-Cap Funds	S&P MidCap 400	36.3	32.4	35.9	31.9	44.5	55.4	73.6	82.2
All Small-Cap Funds	S&P SmallCap 600	39.1	41.2	42.7	43.9	57.2	68.2	79.2	82.2

What about hedge funds?

Barclay Hedge Fund Index

MAY ROR† **2.67%†**

NUMBER OF FUNDS REPORTING† **1528**

YTD THROUGH MAY† **-4.72%***

†Estimated performance for May 2020 calculated with reported data from 1528 funds.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2016	-2.99%	-0.35%	2.45%	1.03%	0.62%	-0.04%	2.04%	0.73%	0.89%	-0.31%	0.82%	1.14%	6.10%
2017	1.34%	1.11%	0.51%	0.59%	0.34%	0.37%	1.08%	0.63%	1.03%	1.08%	0.64%	1.15%	10.36%
2018	2.07%	-1.52%	-0.72%	0.45%	0.74%	-0.47%	0.62%	0.13%	-0.09%	-3.30%	-0.41%	-2.75%	-5.23%
2019	3.64%	1.25%	0.61%	1.15%	-1.72%	2.11%	0.48%	-0.96%	0.32%	0.71%	0.99%	1.67%	10.64%
2020	-0.18%	-2.84%	-9.16%	5.33%§	2.67%†	-	-	-	-	-	-	-	-4.72%*

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The Roots of the Active Investing Malaise

1. A Flatter Investment World: The advantages that professional money managers have over retail investors have shrunk considerably.
2. No Core Philosophy: Most professional money managers seem to have no core philosophy, careening from one to another, based upon last year's winners.
3. Bloated Cost Structures: The costs of professional money managers reflect an older, more forgiving investment world.
4. Lazy investing strategies: Much of active investing is built around using publicly available metrics (PE, PBV etc.) to pick stocks and trusting in mean reversion to deliver results. If you bring nothing to the table, why would you expect to take something away.

And clients bear some of the blame..

- Don't ask, don't know: Knowing past returns are too good to be true, they refuse to ask questions, perhaps because they don't want to hear the answers.
- Long term in principle, short term in results: They claim to be long term, while demanding to see positive performance every three months.
- Make me a lot of money, but don't ever lose a lot: They complain about quasi indexing (while using tracking error to make sure that deviations from the index get punished)
- Not my fault: They refuse to take responsibility for their own financial affairs (blaming their financial advisors for all that goes bad).

In effect, clients get the active money managers they deserve.

The Future of Active Investing

- The active investing business will shrink: Fees will continue to drop but market share will also continue to decline. It will be less profitable and hire fewer people as analysts, portfolio managers and support staff.
- More disruption is coming: The businesses that are most ripe for disruption are ones where the business is big (in terms of dollars spent), the value added is small relative to the costs of running the business and where everyone involved (businesses and their customers) are all unhappy with the status quo. That fits the active money management perfectly and it should come as no surprise that the next wave of disruption is coming from fintech companies.
- Quant investing is not the answer. Anything that can be quantified can be imitated and anything that can be imitated will.

If you want to be an active investor, here is your road map

1. Have an investment philosophy that fits you: The best investment philosophy for you is the one that best fits you as an investor, in sync not only with your views about markets but with your personal makeup (in terms of patience, liquidity needs and skill sets).
2. Balance faith with feedback: Investing requires balancing faith with feedback, faith in your core market beliefs with enough of an acceptance that you can be wrong on the details, to allow for feedback that can modify your investing decisions.
3. Find your investing edge: Drawing on the language of competitive advantages and moats, what sets you apart does not have to be uniquebut it does have to be scarce and not easily replicable.

If you are trusting someone else to invest for you, here's what to look for..

- Humble vs Arrogant: I think that investors are better grouped into humble and arrogant, with
  - Humble investors recognizing that success, when it comes, is as much a function of luck as it is of skill, and failure, when it too arrives, is part of investing and an occasion for learning.
  - Arrogant investors claim every investing win as a sign of their skill and view every loss as an affront, doubling down on their mistakes.
- If I had to pick someone to manage my money, the quality that I would value the most in making that choice is humility, since humble investors are less likely to overpromise and overcommit.

Follow the yellow brick road..