MY VALUATION JOURNEY: HAVE FAITH, YOU MUST!

September 2016
Aswath Damodaran

I. Don't mistake accounting for finance

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

Assets are recorded at original cost, adjusted for depreciation.

The Balance Sheet

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

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

Equity reflects original capital invested and historical retained earnings.

Aswath Damodaran

The financial balance sheet

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

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

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

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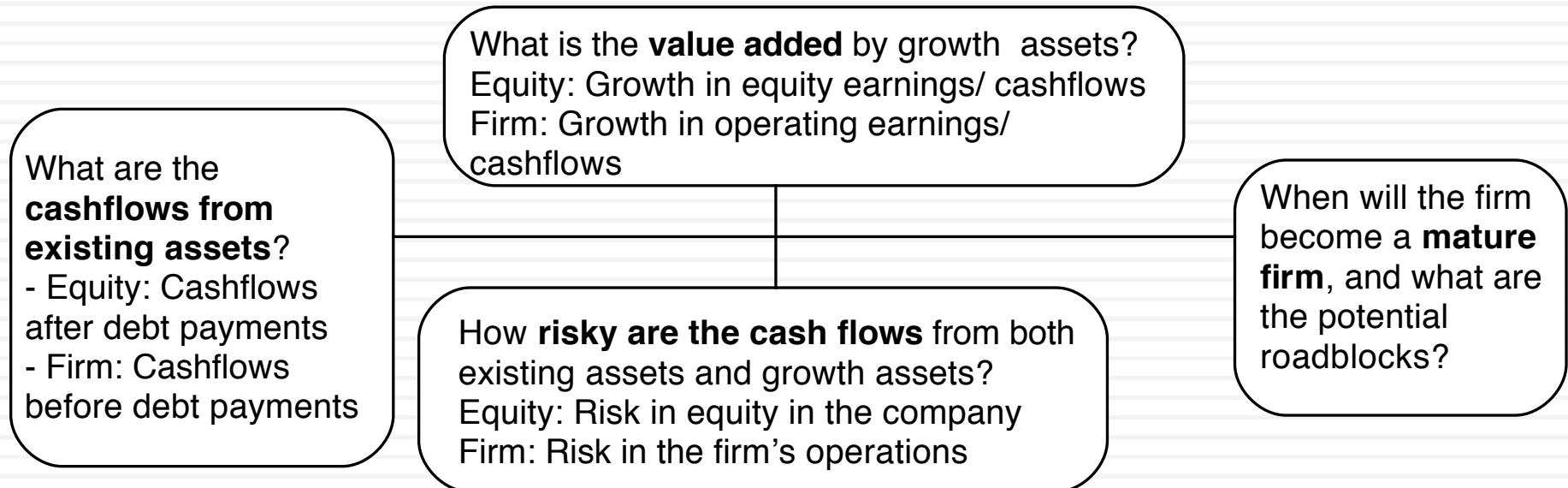
Aswath Damodaran

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

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

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

1. *The IT Proposition*: If "it" does not affect the cash flows or alter risk (thus changing discount rates), "it" cannot affect value.

2. *The DUH Proposition*: For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.

3. *The DON'T FREAK OUT Proposition*: Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.
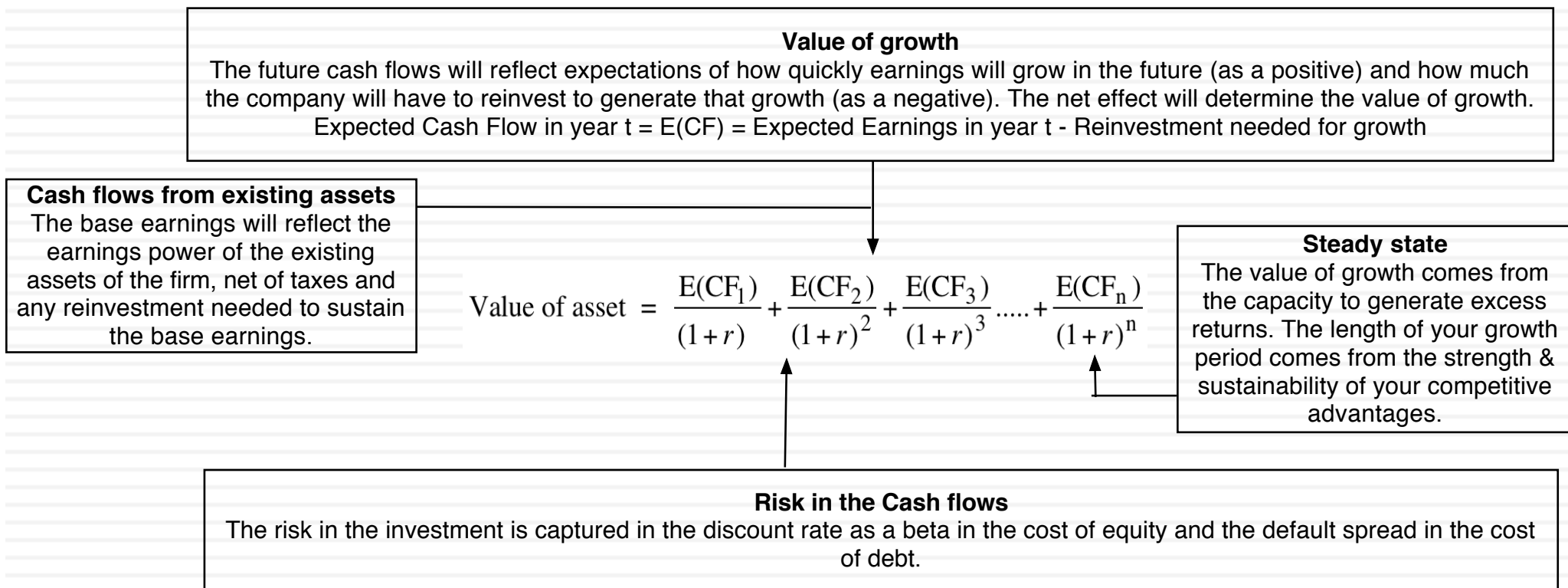
Aswath Damodaran

The drivers of value..

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

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

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

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

Aswath Damodaran

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.

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

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

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

Aswath Damodaran

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

Risk free Rate by Currency: July 2016

Chilean Peso
- Government Bond Rate: 4.48%
- Default Spread: 0.68%
- Risk free Rate: 4.48% -0.68% = 3.80%

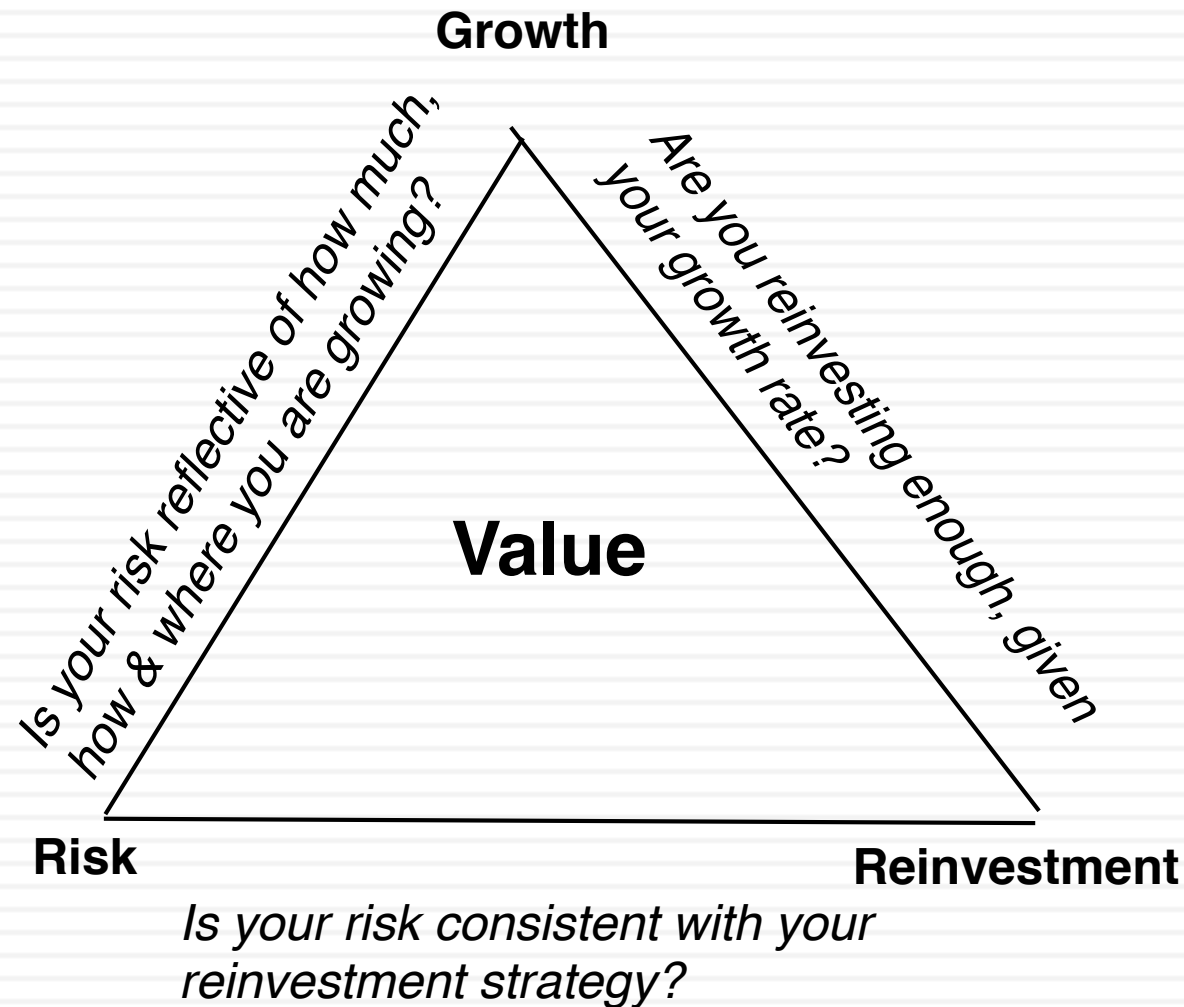Legend: ■ Risk Free Rate ■ Default Spread
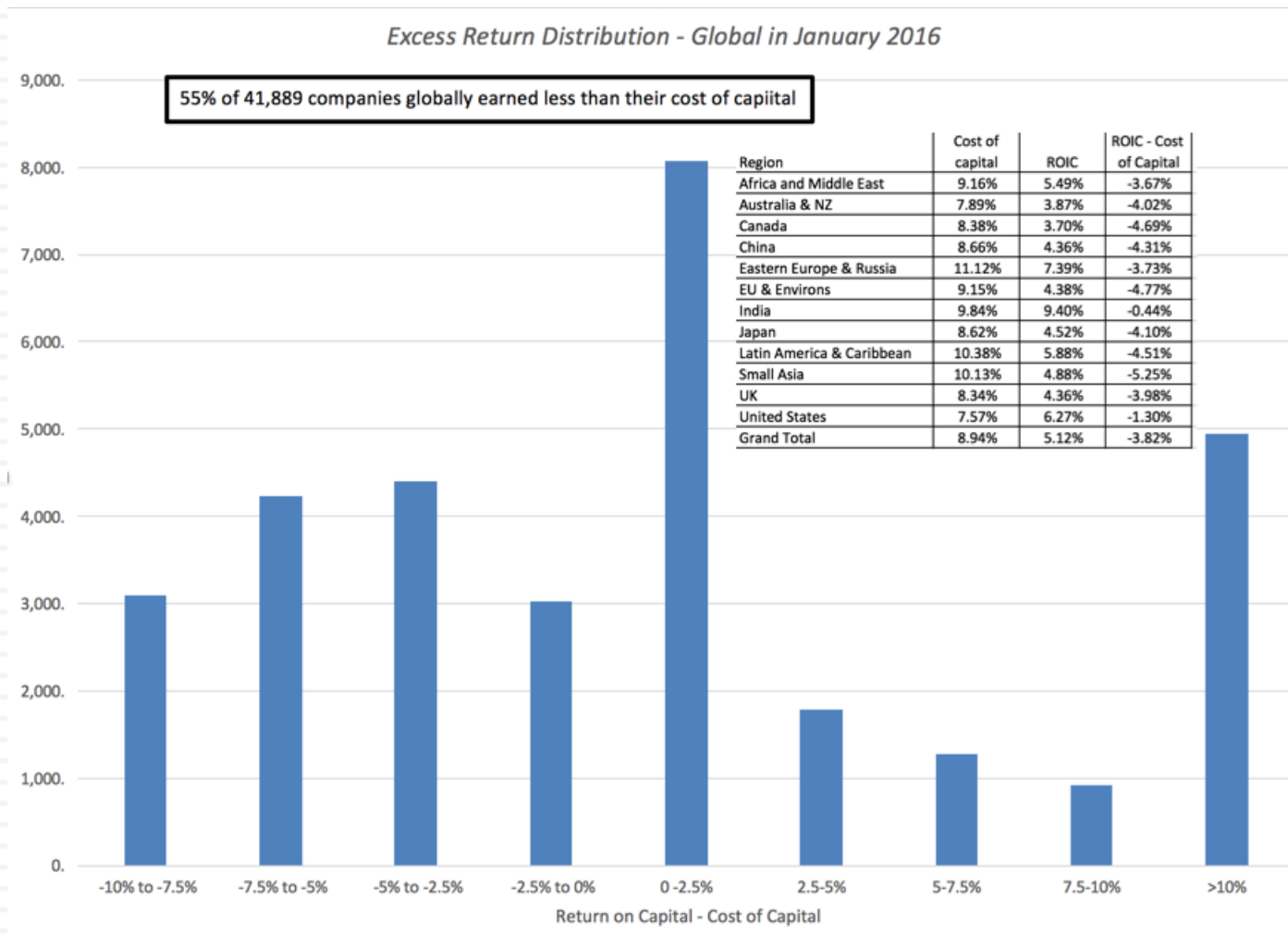
Aswath Damodaran
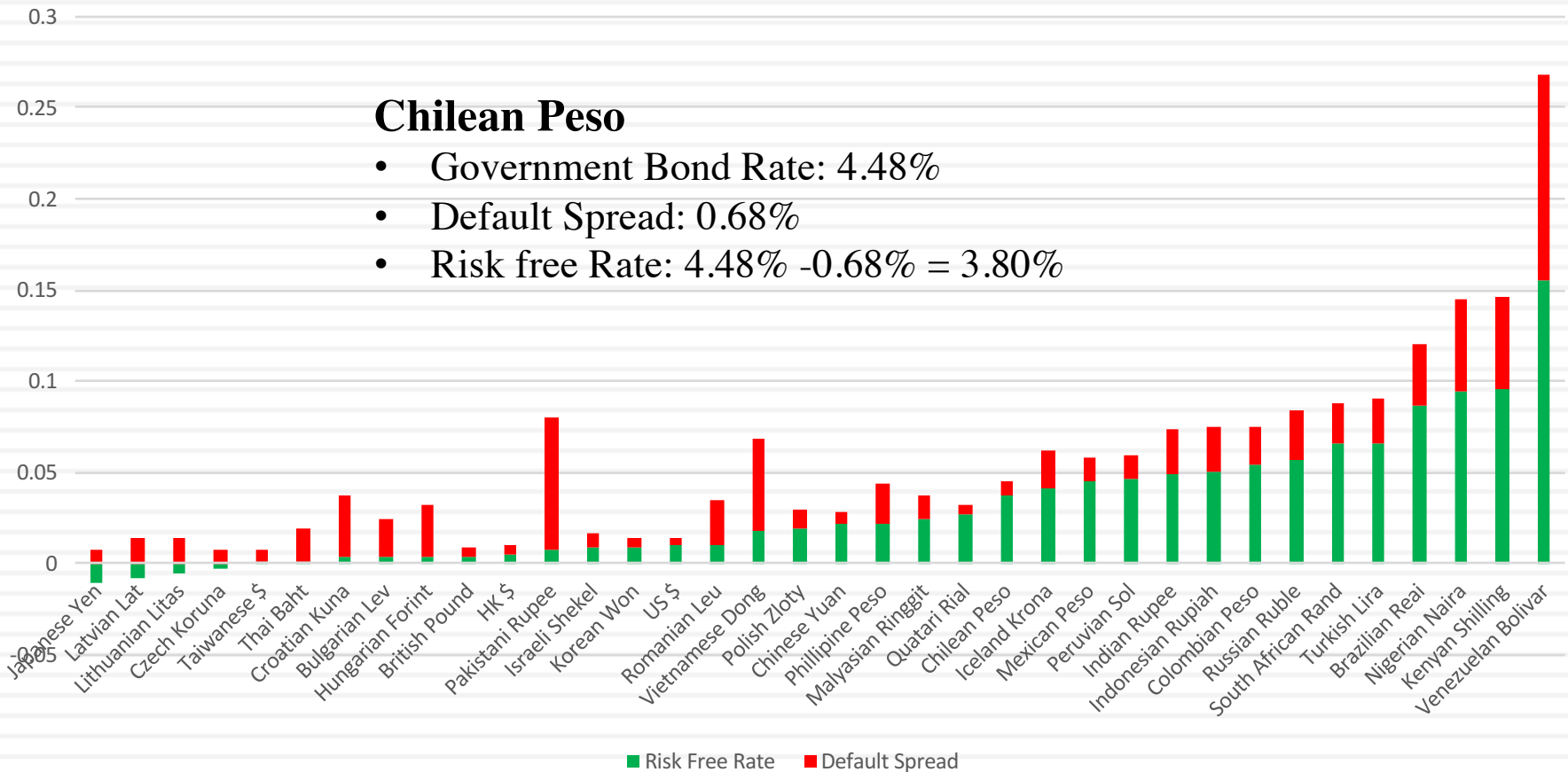
Where is the Argentine Peso?

- Note that the Argentine Peso is not one of the currencies shown in the table. That is because there was no base 10-year Argentine Government bond rate, denominated in pesos, that you could build from.

- Your alternatives are

  - To do your valuation in a different currency

  - To estimate a synthetic risk free rate in pesos, starting with the US dollar risk free rate and incorporating inflation differentials. Using a 15% expected inflation rate in Argentina and a 1% inflation rate in the US, with a US T.Bond rate of 1.5% as the US $ risk free rate:

  - Argentine Peso Risk free rate = (1.015) (1.15/1.01) -1 = 15.57%

Aswath Damodaran

Caveat 2. Don't let your inputs be at war with each other..

Growth

Is your risk reflective of how much, how & where you are growing?

Are you reinvesting enough, given your growth rate?

Value

Risk

Reinvestment

Is your risk consistent with your reinvestment strategy?

Aswath Damodaran

9

And consider the trade offs..

Excess Return Distribution - Global in January 2016

55% of 41,889 companies globally earned less than their cost of capital

Region	Cost of capital	ROIC	ROIC - Cost of Capital
Africa and Middle East	9.16%	5.49%	-3.67%
Australia & NZ	7.89%	3.87%	-4.02%
Canada	8.38%	3.70%	-4.69%
China	8.66%	4.36%	-4.31%
Eastern Europe & Russia	11.12%	7.39%	-3.73%
EU & Environs	9.15%	4.38%	-4.77%
India	9.84%	9.40%	-0.44%
Japan	8.62%	4.52%	-4.10%
Latin America & Caribbean	10.38%	5.88%	-4.51%
Small Asia	10.13%	4.88%	-5.25%
UK	8.34%	4.36%	-3.98%
United States	7.57%	6.27%	-1.30%
Grand Total	8.94%	5.12%	-3.82%

Return on Capital - Cost of Capital

Aswath Damodaran

Caveat 3. Globalization is not a buzz word

- As companies get globalized, the valuations that we do have to reflect that globalization. In particular, we need to be wary of

  - Currency mismatches: Multinationals derive their revenues in many currencies but you have to be currency-consistent.

  - Beta gaming: When a company is listed in many markets, you can get very different betas, depending on how you set up and run a beta regression

  - Equity Risk Premiums: The standard practice of estimating equity risk premiums based on your country of incorporation will lead to skewed valuations.

Western Europe

Country	ERP	CRP	Country	ERP	CRP
Andorra (Principality of)	9.71%	3.46%	Jersey (States of)	6.88%	0.63%
Austria	6.88%	0.63%	Liechtenstein	6.25%	0.00%
Belgium	7.20%	0.95%	Luxembourg	6.25%	0.00%
Cyprus	13.32%	7.07%	Malta	8.14%	1.89%
Denmark	6.25%	0.00%	Netherlands	6.25%	0.00%
Finland	6.88%	0.63%	Norway	6.25%	0.00%
France	7.03%	0.78%	Portugal	10.17%	3.92%
Germany	6.25%	0.00%	Spain	9.23%	2.98%
Greece	21.94%	15.69%	Sweden	6.25%	0.00%
Guernsey (States of)	6.88%	0.63%	Switzerland	6.25%	0.00%
Iceland	9.23%	2.98%	Turkey	9.71%	3.46%
Ireland	8.14%	1.89%	United Kingdom	6.88%	0.63%
Isle of Man	6.88%	0.63%	**Western Europe**	**7.49%**	**1.24%**
Italy	9.23%	2.98%			

Canada	6.25%	0.00%
US	6.25%	0.00%
North America	**6.25%**	**0.00%**

Caribbean	**15.31%**	**9.06%**

Latin America

Argentina	16.46%	10.21%
Belize	20.39%	14.14%
Bolivia	11.91%	5.66%
Brazil	10.97%	4.72%
Chile	7.20%	0.95%
Colombia	9.23%	2.98%
Costa Rica	10.17%	3.92%
Ecuador	16.46%	10.21%
El Salvador	11.91%	5.66%
Guatemala	10.17%	3.92%
Honduras	14.89%	8.64%
Mexico	8.14%	1.89%
Nicaragua	14.89%	8.64%
Panama	9.23%	2.98%
Paraguay	10.17%	3.92%
Peru	8.14%	1.89%
Suriname	13.32%	7.07%
Uruguay	9.23%	2.98%
Venezuela	16.46%	10.21%
Latin America	**11.27%**	**5.02%**

Africa

Country	ERP	CRP
Angola	13.32%	7.07%
Botswana	7.58%	1.33%
Burkina Faso	16.46%	10.21%
Cameroon	14.89%	8.64%
Cape Verde	14.89%	8.64%
Congo (DR)	16.46%	10.21%
Congo (Rep)	14.89%	8.64%
Côte d'Ivoire	11.91%	5.66%
Egypt	16.46%	10.21%
Ethiopia	13.32%	7.07%
Gabon	13.32%	7.07%
Ghana	16.46%	10.21%
Kenya	13.32%	7.07%
Morocco	10.17%	3.92%
Mozambique	18.02%	11.77%
Namibia	9.71%	3.46%
Nigeria	13.32%	7.07%
Rwanda	13.32%	7.07%
Senegal	13.32%	7.07%
South Africa	9.23%	2.98%
Tunisia	11.91%	5.66%
Uganda	13.32%	7.07%
Zambia	16.46%	10.21%
Africa	**12.99%**	**6.74%**

E. Europe

Albania	13.32%	7.07%
Armenia	13.32%	7.07%
Azerbaijan	10.17%	3.92%
Belarus	18.02%	11.77%
Bosnia	16.46%	10.21%
Bulgaria	9.23%	2.98%
Croatia	10.97%	4.72%
Czech Republic	7.36%	1.11%
Estonia	7.36%	1.11%
Georgia	11.91%	5.66%
Hungary	10.17%	3.92%
Kazakhstan	9.71%	3.46%
Kyrgyzstan	14.89%	8.64%
Latvia	8.14%	1.89%
Lithuania	8.14%	1.89%
Macedonia	11.91%	5.66%
Moldova	16.46%	10.21%
Montenegro	11.91%	5.66%
Poland	7.58%	1.33%
Romania	9.71%	3.46%
Russia	10.17%	3.92%
Serbia	13.32%	7.07%
Slovakia	7.58%	1.33%
Slovenia	9.71%	3.46%
Ukraine	21.94%	15.69%
E. Europe	**10.17%**	**3.92%**

Africa (PRS table)

Country	PRS	ERP	CRP	Country	PRS	ERP	CRP
Algeria	60.3	13.72%	7.47%	Malawi	54.8	17.24%	10.99%
Brunei	72.8	9.75%	3.50%	Mali	63.5	13.90%	7.65%
Gambia	61.5	13.72%	7.47%	Myanmar	61.8	13.72%	7.47%
Guinea	48.5	20.00%	13.75%	Niger	53.8	17.24%	10.99%
Guinea-Bissau	64.5	12.48%	6.23%	Sierra Leone	57.3	16.61%	10.36%
Guyana	64.5	12.48%	6.23%	Somalia	41.0	20.00%	13.75%
Haiti	58.0	16.61%	10.36%	Sudan	48.3	20.00%	13.75%
Iran	72.0	11.22%	4.97%	Syria	45.8	20.00%	13.75%
Korea, D.P.R.	56.0	17.24%	10.99%	Tanzania	64.0	13.90%	7.65%
Liberia	52.8	17.24%	10.99%	Togo	61.0	13.72%	7.47%
Libya	50.0	20.00%	13.75%	Yemen, Republic	50.5	17.24%	10.99%
Madagascar	64.5	12.48%	6.23%	Zimbabwe	56.0	17.24%	10.99%

Middle East

Abu Dhabi	7.03%	0.78%
Bahrain	10.97%	4.72%
Iraq	9.71%	3.46%
Israel	7.36%	1.11%
Jordan	13.32%	7.07%
Kuwait	7.03%	0.78%
Lebanon	14.89%	8.64%
Oman	8.76%	2.51%
Qatar	7.03%	0.78%
Ras Al Khaimah	7.58%	1.33%
Saudi Arabia	7.36%	1.11%
Sharjah	8.14%	1.89%
United Arab Emirates	7.03%	0.78%
Middle East	**7.56%**	**1.31%**

Asia

Bangladesh	11.91%	5.66%
Cambodia	14.89%	8.64%
China	7.20%	0.95%
Fiji	13.32%	7.07%
Hong Kong	6.88%	0.63%
India	9.71%	3.46%
Indonesia	9.71%	3.46%
Japan	7.36%	1.11%
Korea	7.03%	0.78%
Macao	7.20%	0.95%
Malaysia	8.14%	1.89%
Mauritius	8.76%	2.51%
Mongolia	14.89%	8.64%
Pakistan	16.46%	10.21%
Papua NG	14.89%	8.64%
Philippines	9.23%	2.98%
Singapore	6.25%	0.00%
Sri Lanka	13.32%	7.07%
Taiwan	7.20%	0.95%
Thailand	8.76%	2.51%
Vietnam	13.32%	7.07%
Asia	**7.82%**	**1.57%**

Australia & NZ

Australia	6.25%	0.00%
Cook Islands	13.32%	7.07%
New Zealand	6.25%	0.00%
Australia & NZ	**6.26%**	**0.01%**

Black #: Total ERP
Red #: Country risk premium
AVG: GDP weighted average

12 Aswath Damodaran

Caveat 4. 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 directly. Then do the karmic thing and let it go. It is out of your control.

San Miguel: November 2015 (in ARS)

The Payoff from growth

Maturity and Closure

	2015	Last 5 years
Revenues (millions)	$2,316.41	CAGR of 23.2%
Operating income (millions)	$845.79	Operating margin = 36.51%
Effective tax rate	33.70%	Average = 36%
Book value of equity (millions)	$1,057	
Invested Capital (millions)	$1,442	
Return on invested capital =	38.90%	

Reinvestment Rate 60.00%

Return on Capital 38.90%

Stable Growth
g = 15%;
Cost of capital = 20%
ROC=20%;
Reinvestment Rate=g/ROC
=15/20%= 75%

Expected Growth
.60*.389=.0968
or 23.34%

Terminal Value = 1,046/(.20-.15) = 20,916

ARS Cashflows

	1	2	3	4	5	6	7	8	9	10	Term Year
Revenue growth rate	23.34%	23.34%	23.34%	23.34%	23.34%	21.67%	20.00%	18.34%	16.67%	15.00%	15.00%
Revenues	$2,857	$3,524	$4,346	$5,361	$6,612	$8,044	$9,653	$11,423	$13,327	$15,327	$ 17,625
EBIT (Operating income)	$1,043	$1,287	$1,587	$1,957	$2,414	$2,937	$3,525	$ 4,171	$ 4,866	$ 5,596	$ 6,436
EBIT(1-t)	$ 692	$ 853	$1,052	$1,298	$1,601	$1,940	$2,319	$ 2,733	$ 3,176	$ 3,638	$ 4,183
- Reinvestment	$ 336	$ 415	$ 512	$ 631	$ 779	$ 892	$1,001	$ 1,102	$ 1,185	$ 1,244	$ 3,137
FCFF	$ 355	$ 438	$ 540	$ 666	$ 822	$1,048	$1,317	$ 1,631	$ 1,991	$ 2,393	$ 1,046

PV(Terminal value)	$ 3,212
PV (CF over next 10 years)	$ 3,314
Value of operating assets =	$ 6,526
- Debt	$ 1,540
+ Cash	$ 466
Value of equity	$ 5,452
Number of shares	644.20
Estimated value /share	$ 8.46

On August 18, 2016, San Miguel was trading at $10.30 per share

Discount at $ Cost of Capital (WACC) = 22.62% (.837) + 12.07% (0.163) = 20.87%

The Risk in the Cash flows

Cost of Equity 22.62%

Cost of Debt (15.57%+.3%)(1-.25) = 12.07%

Weights E = 83.7 % D = 16.3 %

Riskfree Rate: ARS Risk free rate = 15.57%

+

Beta 0.83

X

ERP = 8.53%			
Country	Revenues	Weight	ERP
Argentina	255	11.08%	17.17%
Rest of the World	2047	88.92%	7.45%
San Miguel	2302	100.00%	8.53%

Firm's D/E Ratio: 20.6%

Business	Revenues	EV/Sales	Estimated Value	Unlevered Beta
Farming/Agriculture	$ 476	1.3100	$ 624	0.7600
Food Processing	$ 1,163	1.6400	$ 1,907	0.7200
Company	$ 1,639		$ 2,531	0.7299

Latam: Valuation (September 2013)

Cash flows from existing assets

	2012	2008-2012	US Industry average	Global industry average
Revenues	$9,722	$5,213		
Operating income	$276	$468		
Operating margin	2.84%	8.98%	8.38%	0.05
ROIC	6.07%	15.97%	17.97%	6.94%
Sales/Capital	2.14	1.78	2.74	1.67

Revenue growth of **15%** a year for 5 years, tapering down to 2.5% in year 10

Pre-tax operating margin increases to **8.98%** over time.

Sales to capital ratio of **10.0** for first 5 years, **2.74** thereafter

Maturity & Closure

Stable Growth
g = 2.9%; Beta = 1.00;
Cost of capital = 8.5%
ROC= 8.5%;
Reinvestment Rate=2.9%/8.5% = 34.1%

Terminal Value$_{10}$= 1379/(.085-.025) = $24,621

		Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate			15.00%	15.00%	15.00%	15.00%	15.00%	12.58%	10.16%	7.74%	5.32%	2.90%	2.90%
Revenues		$9,722	$11,181	$12,858	$14,786	$17,004	$19,555	$22,015	$24,251	$26,129	$27,519	$28,317	$29,138
EBIT (Operating) margin		2.84%	3.45%	4.07%	4.68%	5.30%	5.91%	6.52%	7.14%	7.75%	8.36%	8.98%	8.98%
EBIT (Operating income)		$276	$386	$523	$692	$900	$1,155	$1,436	$1,731	$2,025	$2,302	$2,542	$2,616
Tax rate		16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.80%	17.60%	18.40%	19.20%	20.00%	20.00%
EBIT(1-t)	$	232	$ 324	$ 439	$ 581	$ 756	$ 971	$1,195	$1,426	$1,652	$1,860	$2,034	$ 2,093
- Reinvestment			$ 146	$ 168	$ 193	$ 222	$ 255	$ 898	$ 816	$ 685	$ 507	$ 291	$ 714
FCFF			$ 179	$ 272	$ 389	$ 535	$ 716	$ 297	$ 610	$ 967	$1,352	$1,743	$ 1,379

Good — Payoff from growth — Bad

PV(Terminal value)	$ 9,304.39
PV (CF over next 10 years)	$ 3,547.29
Value of operating assets =	$ 12,851.68
- Debt	$ 9,559.56
- Minority interests	$ 26.73
+ Cash	$ 1,286.80
+ Non-operating assets	$ 3.76
Value of equity	$ 4,555.95
Number of shares	475.12
Estimated value /share	$ 9.59
In Chilean Pesos	CLP 4,860

Cost of capital decreases to 8.5% from years 6-10

Cost of capital = 16.92% (.466) + 5.76% (.534) = 10.96%

In September 2013, the stock was trading at 8,910 CLP/share.

Cost of Equity 16.92%

Cost of Debt
Bond rating: BB+
(2.9%+4.3%)(1-.20) = 5.76%

Weights
E = 46.6% D = 53.4%

Riskfree Rate:
Riskfree rate = 2.90%

+

Beta 1.57

X

ERP 8.92%

Financial Risk

Unlevered Beta for Airline Business: 0.82

D/E=144.5%

The Operating Risk

Brazil	34.3	34.30%	8.75%
Chile	15.7	15.70%	6.95%
United States of America	13	13.00%	5.75%
Peru	6.4	6.40%	8.75%
Colombia	3.8	3.80%	9.13%
Ecuador	2.7	2.70%	17.75%
Argentina	9.2	9.20%	15.88%
Western Europe	7.6	7.60%	6.97%
Central and South America	7.3	7.30%	9.69%
Total	100	100.00%	8.92%

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

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

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

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

$$D+CF \neq DCF$$
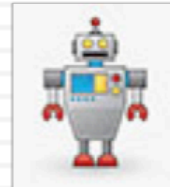
In a **Robo DCF**, the analyst builds a valuation almost entirely from the most recent financial statements and automated forecasts.
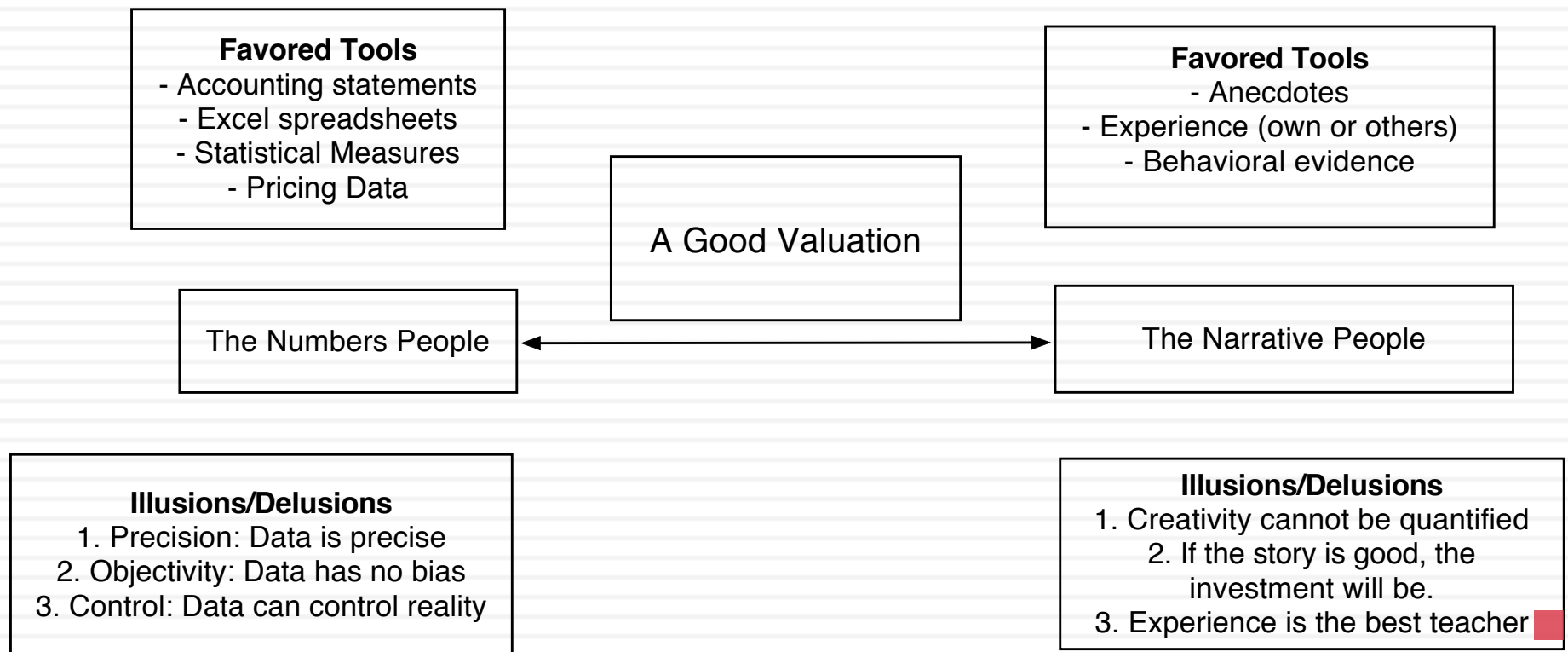
In a **Dissonant DCF**, assumptions about growth, risk and cash flows are not consistent with each other, with little or no explanation given for the mismatch.

A **Mutant DCF** is a collection of numbers where items have familiar names (free cash flow, cost of capital) but the analyst putting it together has neither a narrative nor a sense of the basic principles of value or economics.
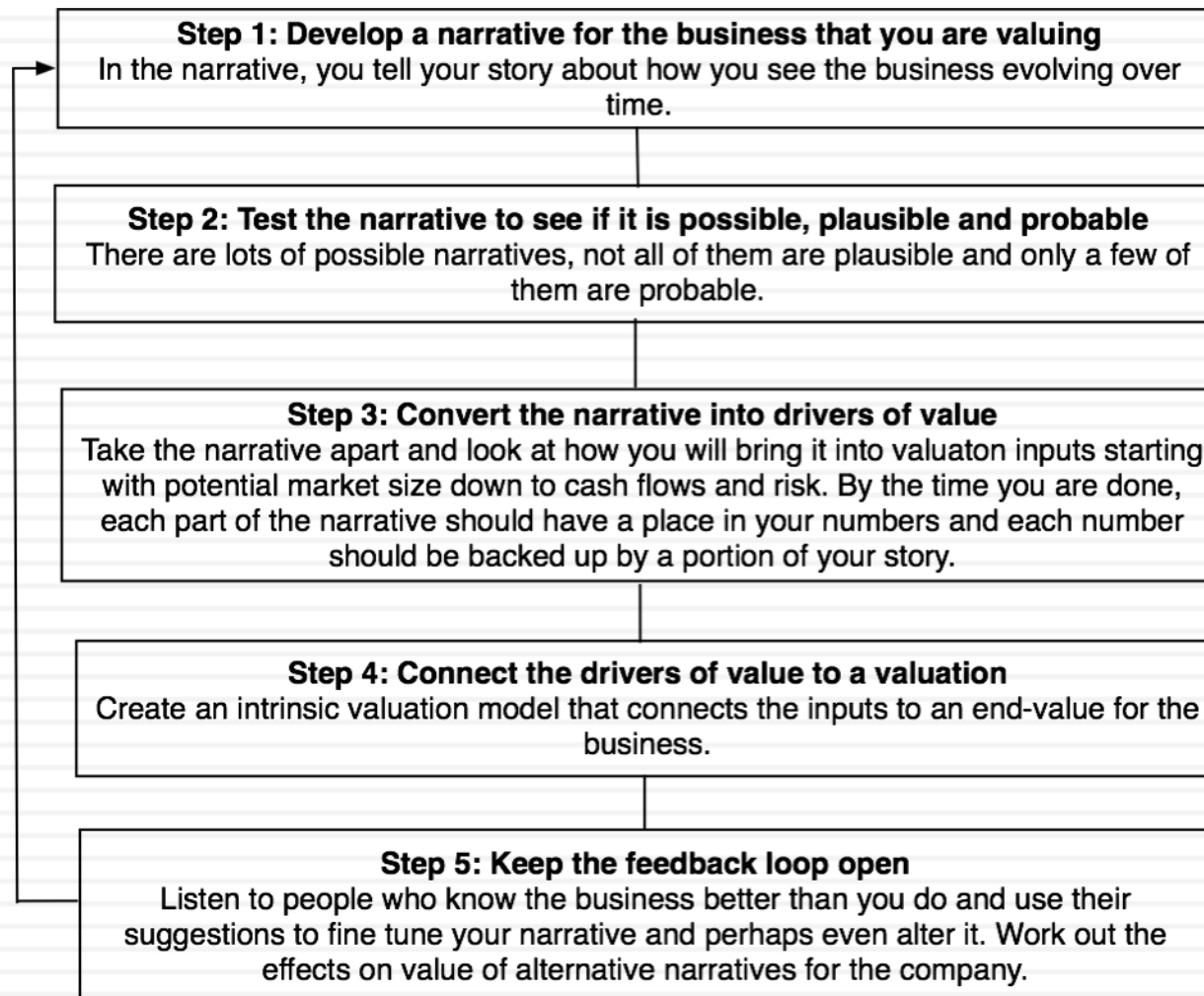
III. Don't mistake modeling for valuation

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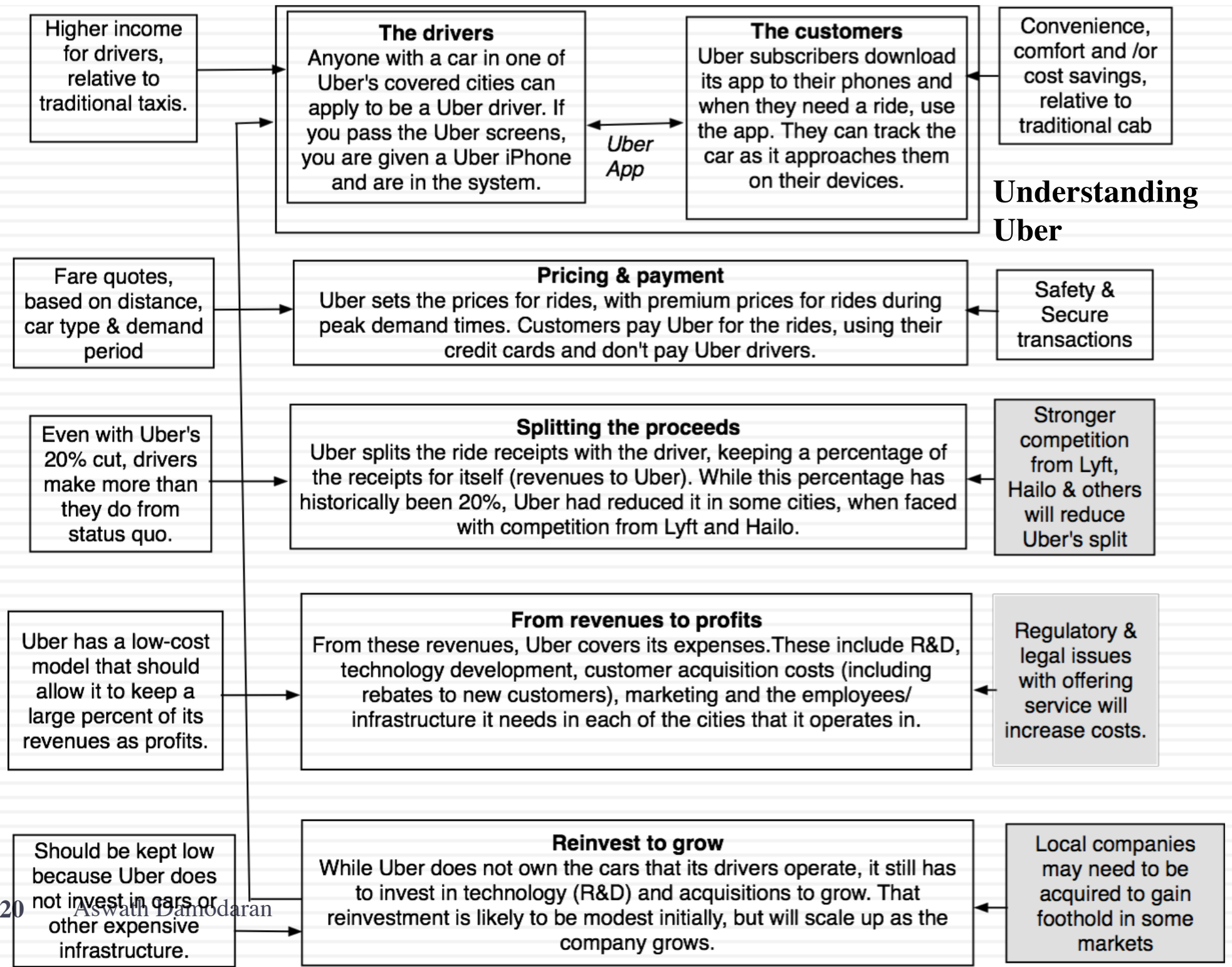- Excel spreadsheets
- Statistical Measures
- Pricing Data

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

A Good Valuation

The Numbers People ⟵————————⟶ The Narrative People

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

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

Aswath Damodaran

From story to numbers and beyond..

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

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 by 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 for 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.

Aswath Damodaran

Step 1: Survey the landscape

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

Aswath Damodaran

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

Step 2: Create a narrative for the future

- Every valuation starts with a narrative, a story that you see unfolding for your company in the future.

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

Aswath Damodaran

The Uber Narrative

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

1. An urban car service business: I saw Uber primarily as a force in urban areas and only in the car service business.

2. Which would expand the business moderately (about 40% over ten years) by bringing in new users.

3. With local networking benefits: If Uber becomes large enough in any city, it will quickly become larger, but that will be of little help when it enters a new city.

4. Maintain its revenue sharing (20%) system due to strong competitive advantages (from being a first mover).

5. And its existing low-capital business model, with drivers as contractors and very little investment in infrastructure.

Aswath Damodaran

Probability of occurrence

Cannot assess   Low   Increasing

"IT" IS POSSIBLE
This could happen, but you are not sure what "this" is, when it will happen and what it will look like when it does.

Gauge market potential & test products

"IT" IS PLAUSIBLE
This is something that you can make a reasoned argument could happen, though you have no tangible evidence for it happening (yet).

Product success & Financial results

IT IS PROBABLE
This is something that you expect to happen, with some basis or evidence for that expectation. There can be substantial uncertainty in your expectations.

VALUATION RESPONSE
Value as an option, with the value increasing with the size of the possible market and the exclusivity of your firm's access to that market.

VALUATION RESPONSE
Show as expected growth, adjusting for risk in your expected return. Value will increase with size of the market and your firm's competitive advantages.

VALUATION RESPONSE
Show in base year numbers and expected cash flows, adjusting for risk in your expected return.

Aswath Damodaran

23

The Impossible, The Implausible and the Improbable

The Impossible

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

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

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

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

The Implausible

Growth without reinvestment
Assuming growth forever without reinvestment.

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

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

The Improbable

Growth

High Growth and Low Risk

High Growth & Low Reinvestment

Value Narrative

Low Risk and High Reinvestment

Risk

Reinvestment

Aswath Damodaran

Uber: Possible, Plausible and Probable

Uber (My narrative))

Possible
Car ownership market
Option value

Plausible
Suburban car service & rental market
Higher growth rate

Probable
Urban taxi market
In Total Market size, Revenues & Earnings

Aswath Damodaran

25
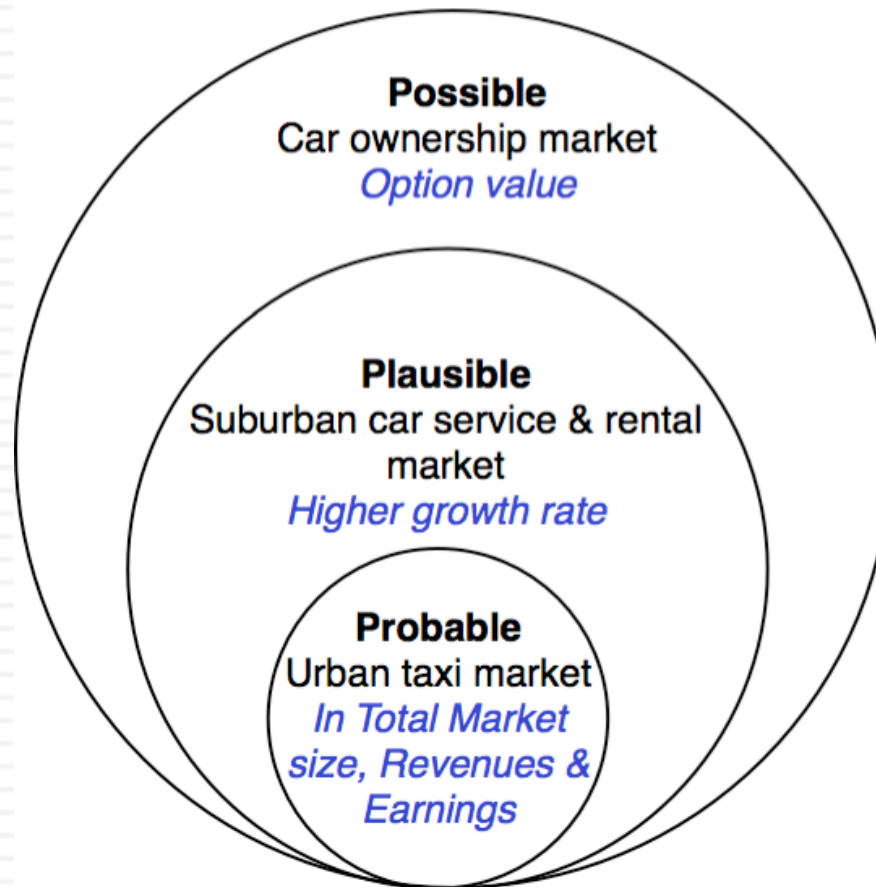
The Impossible: The Runaway Story

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

Companies valued at $1 billion or more by venture-capital firms

Theranos valued at $9 billion

125 COMPANIES

$1 billion $10 billion $40 billion

Valuations as of **October 2015**

Select companies from the chart or table for more detail.

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)

Step 4: Connect your narrative to key drivers of value

The Uber narrative (June 2014)

Uber is an **urban car service company,** competing against taxis & limos in urban areas, but it may expand demand for car service. **The global taxi/limo business is $100 billion in 2013, growing at 6% a year.**

Total Market

X

Market Share

Uber will have competitive advantages against traditional car companies & against newcomers in this business, but no global networking benefits. *Target market share is 10%*

=

Revenues (Sales)

-

Operating Expenses

Uber will maintain its current model of keeping 20% of car service payments, even in the face of competition, because of its first mover advantages. It will maintain its current low-infrastructure cost model, allowing it to earn high margins. **Target pre-tax operating margin is 40%.**

=

Operating Income

-

Taxes

=

After-tax Operating Income

Uber has a low capital intensity model, since it does not own cars or other infrastructure, allowing it to maintain a high **sales to capital ratio for the sector (5.00)**

-

Reinvestment

=

After-tax Cash Flow

The company is young and still trying to establish a business model, leading to a **high cost of capital (12%)** up front. As it grows, it will become safer and its cost of capital will drop to 8%.

Adjust for time value & risk

Adjusted for operating risk with a discount rate and for failure with a probability of failure.

VALUE OF OPERATING ASSETS

Cash

Uber has cash & capital, but there is a chance of failure. **10% probability of failure.**

Aswath Damodaran

Step 4: Value the company (Uber)

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

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

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

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

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.

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

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

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

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

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

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

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

Value of operating assets = $6,595

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

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

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

Aswath Damodaran

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.

Aswath Damodaran

The Uber Feedback Loop: Bill Gurley

1. <u>Not just car service company.</u>: 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. <u>Not just urban</u>: Uber can create new demands for car service in parts of the country where taxis are not used (suburbia, small towns).

3. <u>Global networking benefits</u>: 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)

Aswath Damodaran

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

Aswath Damodaran

Step 6: If the world changes, your narrative has to change with it..

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

Aswath Damodaran

Uber: The September 2015 Update

Input	June 2014	September 2015
Total Market	$100 billion; Urban car service	$230 billion; Logistics
Growth in market	Increase market size by 34%; CAGR of 6%.	Double market size; CAGR of 10.39%.
Market Share	10% (Local Networking)	25% (Weak Global Networking)
Slice of gross receipts	20% (Left at status quo)	15% (Competitive pressures)
Operating margin	40% (Low cost model)	25% (Partial employee model)
Cost of capital	12% (Ninth decile of US companies)	10% (75th percentile of US companies)
Probability of failure	10%	0% (Enough capital to fend off failure)
Value of equity	$5.9 billion	$23.4 billion

Aswath Damodaran

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

Better accurate than precise

| High Accuracy High Precision | Low Accuracy High Precision | High Accuracy Low Precision | Low Accuracy Low Precision |

It's all relative

Scenario 1 | Scenario 2

You

Rest of world

Aswath Damodaran
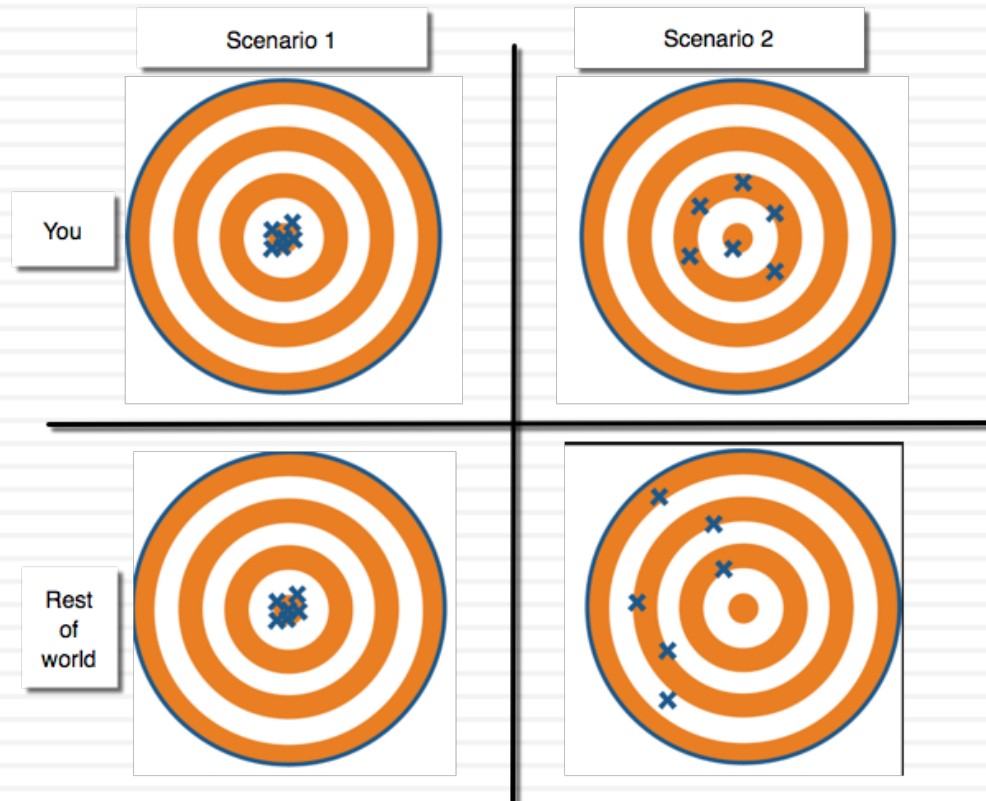
Introducing the corporate life cycle

	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 Mature Growth	Stage 5 Mature Stable	Stage 6 Decline
Growth stage						
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.

Aswath Damodaran

The Investor Challenge

Growth stage	Stage 1 Start-up	Stage 2 Young Growth	Stage 3: High Growth	Stage 4 & 5 Mature Stable	Stage 6 Decline
Key Questions	Is there a market for the product or service? How big is that market? Will you survive?	Do people use your product or service? How much do they like it?	Will people pay for the product or service? Can you scale up, i.e., grow as you get bigger?	Can you make money of the product and service and sustain profitability in the face of competition?	What will you get if you sell your assets? How do you plan to return cash flows to your investors?
Pricing Metrics & Measures	Market size, Cash on hand, Access to capital	Number of users, User intensity (EV/User)	User engagement with model, Revenues (EV/Sales)	Earnings levels and growth (PE, EV/EBIT)	Cash flows, Payout & Debt servicing (PBV, EV/EBITDA)
Narrative vs Numbers	Mostly or all narrative	More narrative than numbers	Mix of narrative & numbers	More numbers than narrative	Mostly or all numbers
Value Drivers	Total market size, Market Share & Target Margin	Revenue Growth (and its drivers)	Revenue Growth & Reinvestment	Operating margins and Return on capital	Dividends/Cash Returns & Debt ratios
Dangers	*Macro delusions*, where companies are collectively overpriced, given market size.	*Value distractions*, with focus on wrong revenue drivers.	*Growth illusions*, with failure to factor in the cost of growth.	*Disruption Denial*, with failure to see threats to sustainable profits.	*Liquidation leakage*, with unrealistic assumptions about what others will pay for liquidated assets.
Transitions		*Potential to Product*	*Product to Revenues*	*Revenues to Profits*	*Profits to Cash flows*

Aswath Damodaran

Valuing a start up is hard to do..

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

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

Cash flows from existing assets non-existent or negative.

What is the value added by growth assets?

What are the cashflows from existing assets?

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

Different claims on cash flows can affect value of equity at each stage.

How risky are the cash flows from both existing assets and growth assets?

What is the value of equity in the firm?

Limited historical data on earnings, and no market prices for securities makes it difficult to assess risk.

Will the firm make it through the gauntlet of market demand and competition? Even if it does, assessing when it will become mature is difficult because there is so little to go on.

Aswath Damodaran

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

Aswath Damodaran

Twitter: Priming the Pump for Valuation

1. Make small revenues into big revenues

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

2. Make losses into profits

Company	Operating Margin
Google Inc. (NasdaqGS:GOOG)	22.82%
Facebook, Inc. (NasdaqGS:FB)	29.99%
Yahoo! Inc. (NasdaqGS:YHOO)	13.79%
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

	Annual growth rate in Global Advertising Spending				
	2.00%	2.50%	3.00%	3.50%	4.00%
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

Online advertising share of market (row labels at left: 20%, 25%, 30%, 35%, 40%)

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

	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

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

X

Risk Premium
6.15%

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

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

D/E=1.71%
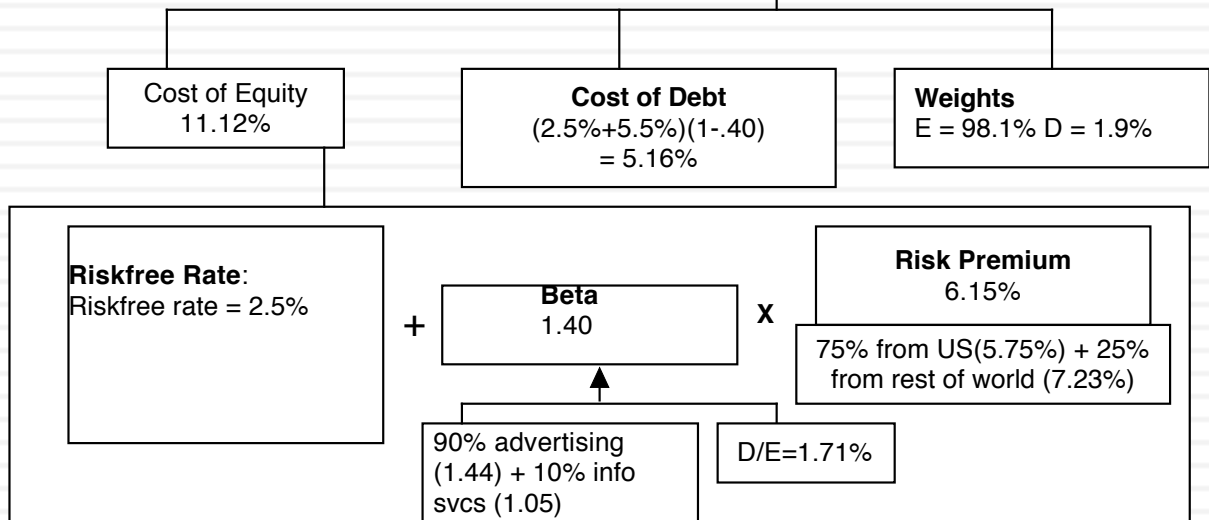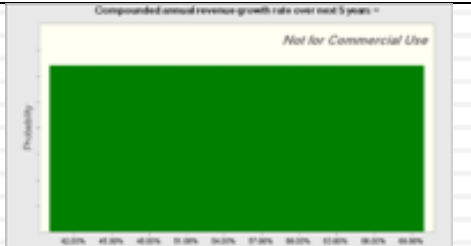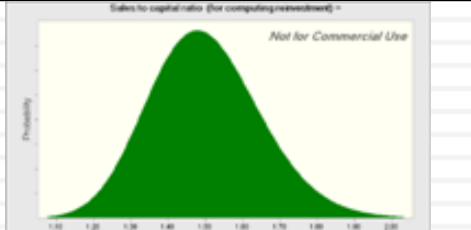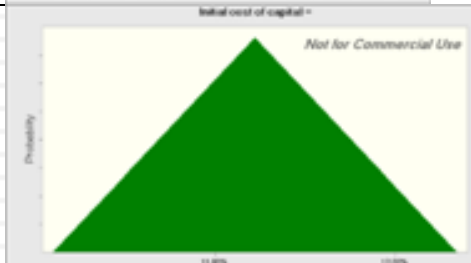
A sobering reminder: You will be "wrong" and it is okay

- 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.

Aswath Damodaran

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

Aswath Damodaran
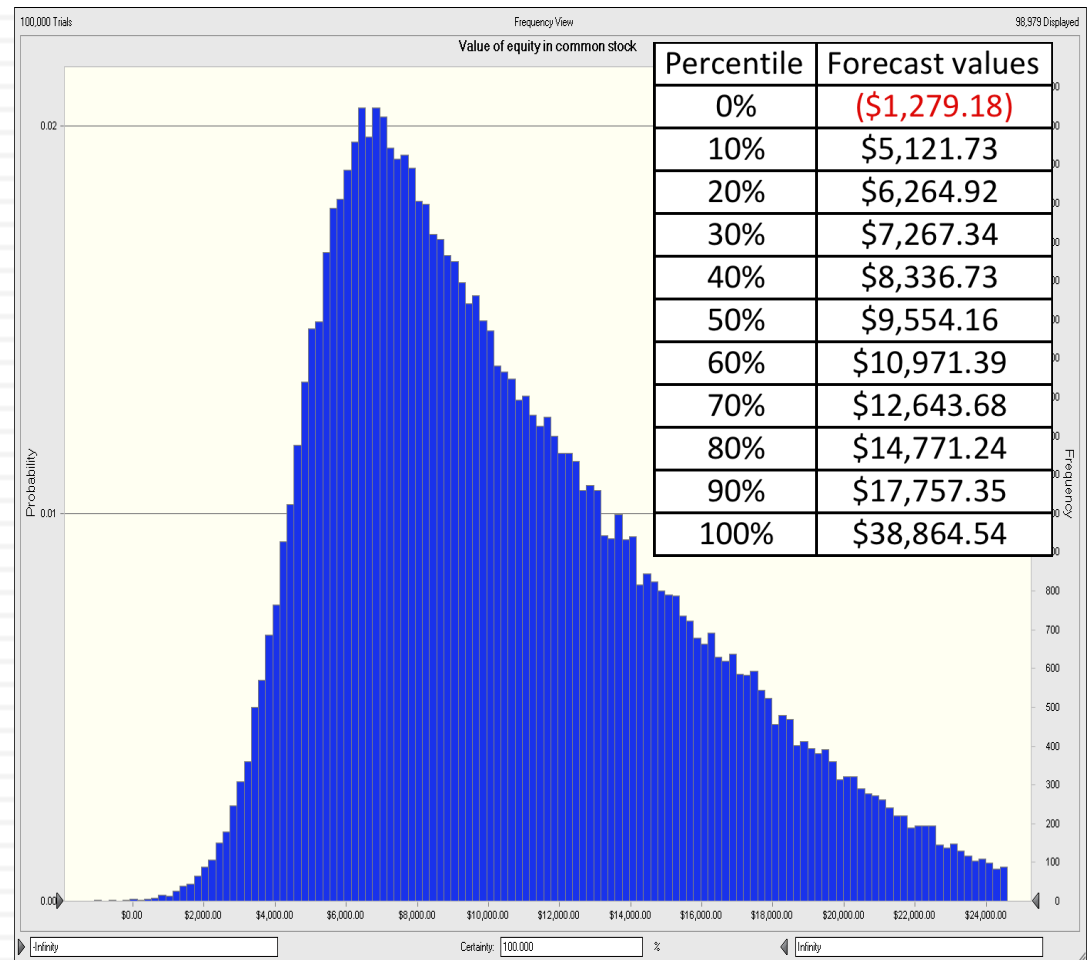
Forecasting in the face of uncertainty. A test:

□ 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%

Aswath Damodaran

But the payoff is greatest where there is the most uncertainty…

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%

Further changeability analysis »

Weather forecast accuracy for Honolulu, Hawaii

Last Month		Last Year	
MeteoGroup	88.44%	MeteoGroup	88.50%
Persistence	81.80%	CustomWeather	85.87%
CustomWeather	78.23%	AccuWeather	81.82%
The Weather Channel	73.12%	The Weather Channel	81.56%
AccuWeather	69.89%	Persistence	80.44%
Weather Underground	62.10%	Weather Underground	67.07%
National Weather Service	48.39%	National Weather Service	59.90%
Foreca	44.35%	Foreca	57.52%
WeatherBug	32.26%	WeatherBug	37.09%

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%

Further changeability analysis »

Weather forecast accuracy for Epping, North Dakota

Last Month		Last Year	
MeteoGroup	62.50%	MeteoGroup	66.97%
Foreca	61.61%	The Weather Channel	66.73%
The Weather Channel	61.31%	AccuWeather	64.86%
AccuWeather	60.42%	WeatherBug	64.80%
Weather Underground	56.85%	Foreca	62.75%
WeatherBug	56.17%	CustomWeather	62.70%
National Weather Service	54.76%	National Weather Service	62.64%
CustomWeather	54.46%	Weather Underground	61.38%
Persistence	38.01%	Persistence	44.09%

2004 Best Places Rank: 210, 280, 350, 420, 490, 560, 630, 700

Aswath Damodaran
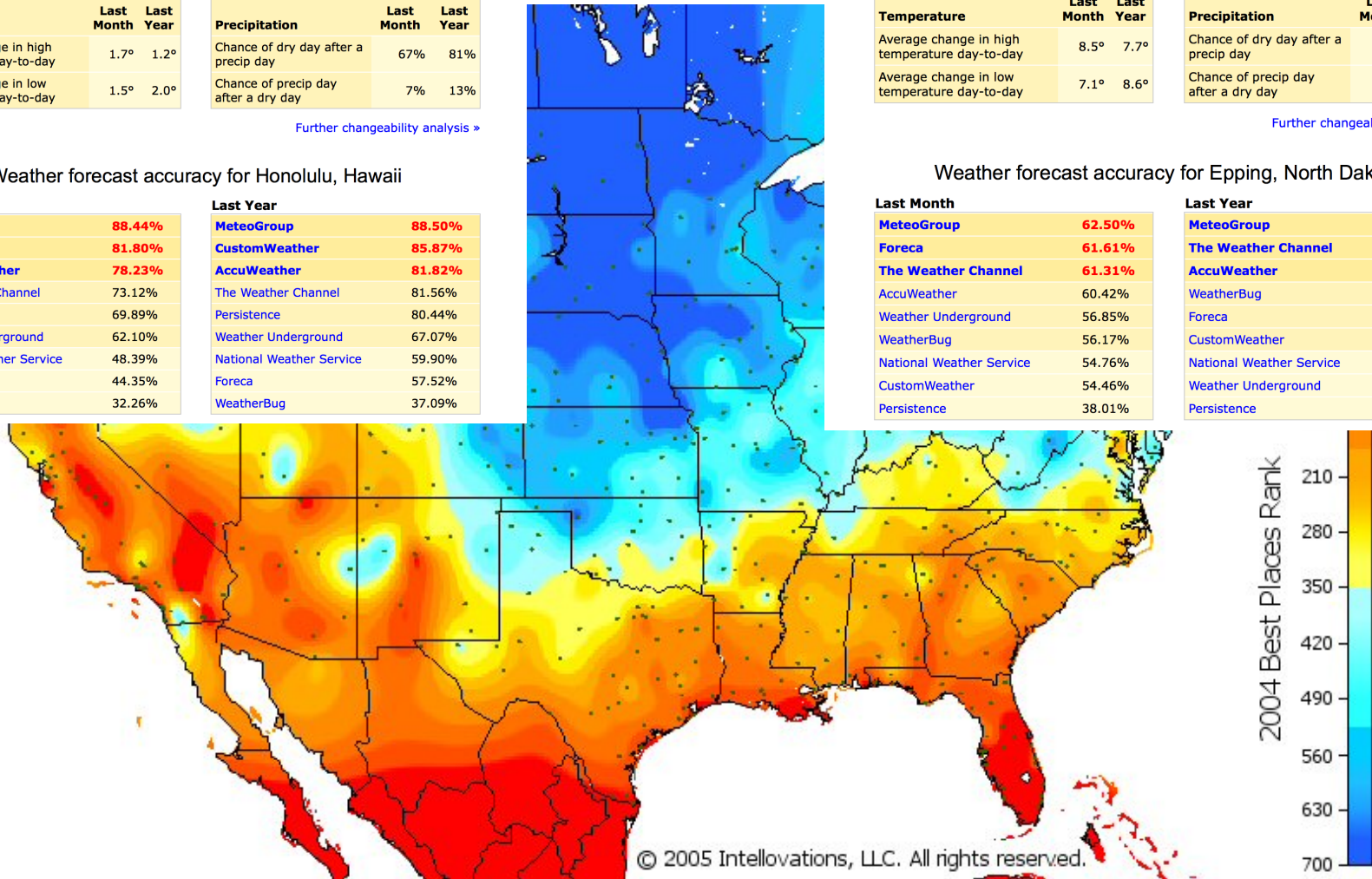
V. Don't mistake price for value!

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

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

Accounting Estimates

Valuation Estimates

INTRINSIC VALUE

Value

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

Price

PRICE

Aswath Damodaran

48

Test 1: Are you pricing or valuing?

Aswath Damodaran

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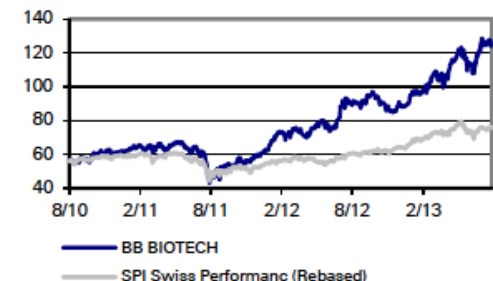
Performance (%)	1m	3m	12m
Absolute	-1.4	5.4	37.4

Aswath Damodaran

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

Aswath Damodaran

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?

Aswath Damodaran

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

VI. Investing is an act of faith..

□ When investing, we are often told that if you are virtuous (careful in your research, good at valuation, have a long time horizon), you will be rewarded (with high returns).

□ That pitch is amplified by anecdotal evidence of righteous ones, i.e., those who have followed the path to success.

□ Those who chose not to be virtuous are labeled as "speculators", viewed as shallow and deserving of the fate that awaits them.

Aswath Damodaran

Follow the yellow brick road..

Aswath Damodaran