# NUMBERS AND NARRATIVE: MODELING, STORY TELLING AND INVESTING

Aswath Damodaran

# Let’s start with an experiment

A valuation of Amazon in October 2014

# A DCF valuation of Amazon

***Amazon: A DCF valuation in late October 2014***

Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

| | *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% | 12.44% | 9.88% | 7.32% | 4.76% | 2.20% | 2.20% |
| Revenues | $ 85,246 | $98,033 | $112,738 | $129,649 | $149,096 | $171,460 | $192,790 | $211,837 | $227,344 | $238,166 | $243,405 | $ 248,760 |
| EBIT (Operating) margin | 0.58% | 1.26% | 1.94% | 2.62% | 3.30% | 3.98% | 4.66% | 5.34% | 6.02% | 6.70% | 7.38% | 7.38% |
| EBIT (Operating income) | $ 494 | $ 1,235 | $ 2,187 | $ 3,397 | $ 4,920 | $ 6,824 | $ 8,984 | $ 11,312 | $ 13,686 | $ 15,957 | $ 17,963 | $ 18,358 |
| Tax rate | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% |
| EBIT(1-t) | $ 337 | $ 842 | $ 1,492 | $ 2,317 | $ 3,356 | $ 4,654 | $ 6,127 | $ 7,715 | $ 9,334 | $ 10,883 | $ 12,251 | $ 12,520 |
| - Reinvestment | | $ 3,474 | $ 3,995 | $ 4,594 | $ 5,284 | $ 6,076 | $ 5,795 | $ 5,175 | $ 4,213 | $ 2,940 | $ 1,424 | $ 2,755 |
| FCFF | | $ (2,632) | $ (2,504) | $ (2,278) | $ (1,928) | $ (1,422) | $ 332 | $ 2,540 | $ 5,121 | $ 7,943 | $ 10,827 | $ 9,766 |
| Terminal Value | | | | | | | | | | | $168,379 | |
| Cost of capital | | 8.39% | 8.39% | 8.39% | 8.39% | 8.39% | 8.32% | 8.24% | 8.16% | 8.08% | 8.00% | 8.00% |
| PV(FCFF) | | $ (2,489) | $ (2,189) | $ (1,842) | $ (1,446) | $ (994) | $ 169 | $ 1,420 | $ 2,681 | $ 3,865 | $ 80,918 | |

Operating margin improves to 7.38% in year 10, weighted average of retail & media businesses

Reinvest $1 for every $3.68 in additional revenues

| | |
|---|---|
| PV(Terminal value) | $ 76,029 |
| PV (CF over next 10 years) | $ 4,064 |
| Value of operating assets = | $ 80,093 |
| - Debt | $ 8,353 |
| + Cash | $ 10,252 |
| Value of equity | $ 81,143 |
| - Value of options | $ - |
| Value of equity in common stock | $ 81,125 |
| Number of shares | 463.01 |
| Estimated value /share | $ 175.25 |
| Price | $ 287.06 |
| Price as % of value | 163.84% |

Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

# A ‘narrative’ about Amazon: A “Field of Dreams” Company

1. Continue high revenue growth: In valuing Amazon, I am going to assume that the company is going to continue on its path of growing revenues rapidly (high revenues), with media and cloud services adding to retail, to become the second largest retailer in the world.
2. By selling products at or below cost: In pursuit of this growth, Amazon will continue to give away its products and services at or below cost, leading to a continuation of low operating margins for the next few years.
3. Aspirations of using market power: Once Amazon reaches a dominant position, it will raise prices on products/ services but the ease with which new entrants can come into the business will act as a restraint on prices (keeping operating margins constrained in long term).
4. Low/different reinvestment: Amazon will have to invest in a mix of assets, including infrastructure, computing services, acquisitions and product development, but will be able to deliver more revenues/dollar investment than the typical retail firm.
5. Shifting risk profile: Amazon’s risk profile will be a mix of retail, entertainment and business services as well as its geographic ambitions, and the technology twist to its business will keep debt ratios low (lower than brick and mortar retailers).

# A quick test

- Now that you have been exposed to two different valuations of Amazon, one driven entirely by numbers and one set as a story, which one do you find more credible?
  a. The DCF valuation
  b. The Amazon story
- Which one are you more likely to remember tomorrow?
  a. The DCF valuation
  b. The Amazon story
- What would your biggest concern be with each one?

# Marrying numbers & narrative

*To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost.* Operating margin stays low for the next few years.

*Amazon will continue on its path of revenue growth first, pushing into media & cloud servies to become the second largest retailer in the world.* Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

| | *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% | 12.44% | 9.88% | 7.32% | 4.76% | 2.20% | 2.20% |
| Revenues | $ 85,246 | $98,033 | $112,738 | $129,649 | $149,096 | $171,460 | $192,790 | $211,837 | $227,344 | $238,166 | $243,405 | $ 248,760 |
| EBIT (Operating) margin | 0.58% | 1.26% | 1.94% | 2.62% | 3.30% | 3.98% | 4.66% | 5.34% | 6.02% | 6.70% | 7.38% | 7.38% |
| EBIT (Operating income) | $ 494 | $ 1,235 | $ 2,187 | $ 3,397 | $ 4,920 | $ 6,824 | $ 8,984 | $ 11,312 | $ 13,686 | $ 15,957 | $ 17,963 | $ 18,358 |
| Tax rate | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% |
| EBIT(1-t) | $ 337 | $ 842 | $ 1,492 | $ 2,317 | $ 3,356 | $ 4,654 | $ 6,127 | $ 7,715 | $ 9,334 | $ 10,883 | $ 12,251 | $ 12,520 |
| - Reinvestment | | $ 3,474 | $ 3,995 | $ 4,594 | $ 5,284 | $ 6,076 | $ 5,795 | $ 5,175 | $ 4,213 | $ 2,940 | $ 1,424 | $ 2,755 |
| FCFF | | $ (2,632) | $ (2,504) | $ (2,278) | $ (1,928) | $ (1,422) | $ 332 | $ 2,540 | $ 5,121 | $ 7,943 | $ 10,827 | $ 9,766 |
| Terminal Value | | | | | | | | | | | $168,379 | |
| Cost of capital | | 8.39% | 8.39% | 8.39% | 8.39% | 8.39% | 8.32% | 8.24% | 8.16% | 8.08% | 8.00% | 8.00% |
| PV(FCFF) | | $ (2,489) | $ (2,189) | $ (1,842) | $ (1,446) | $ (994) | $ 169 | $ 1,420 | $ 2,681 | $ 3,865 | $ 80,918 | |

*As Amazon becomes more dominant, it will increase prices, but easy entry into the business will act as a restraint.* Operating margin improves to 7.38% in year 10, weighted average of retail & media businesses

*Amazon will be able to invest more efficiently that the average retailer.* Reinvest $1 for every $3.68 in additional revenues

| | |
|---|---|
| PV(Terminal value) | $ 76,029 |
| PV (CF over next 10 years) | $ 4,064 |
| Value of operating assets = | $ 80,093 |
| - Debt | $ 8,353 |
| + Cash | $ 10,252 |
| Value of equity | $ 81,143 |
| - Value of options | $ - |
| Value of equity in common stock | $ 81,125 |
| Number of shares | 463.01 |
| Estimated value /share | $ 175.25 |
| Price | $ 287.06 |
| Price as % of value | 163.84% |

*Amazon's technology twist will keep financial leverage low*: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

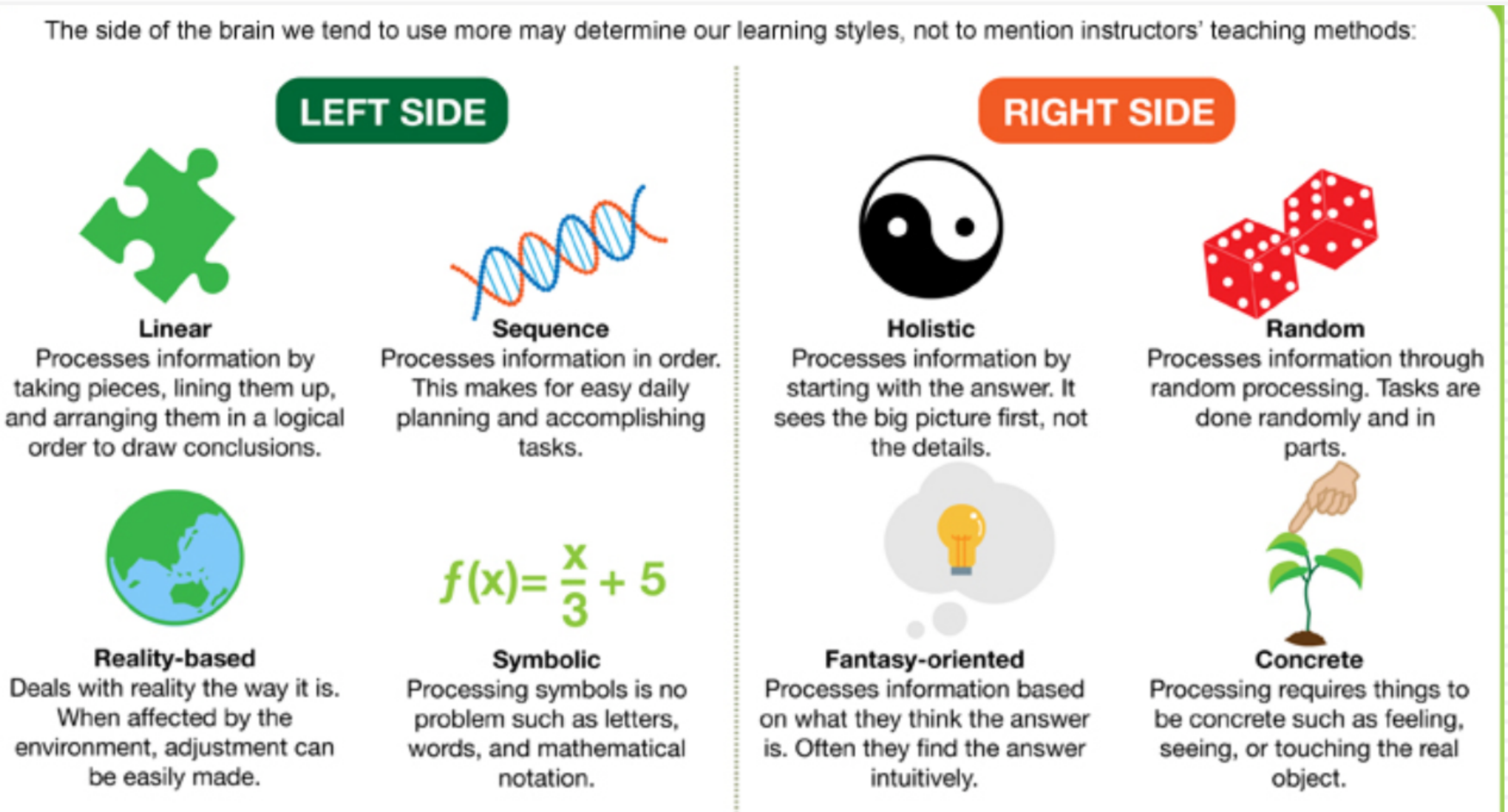
*Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions*: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

***Amazon: A DCF valuation in late October 2014***

# Numbers person or Story teller?

Vive le difference!

# Left Brain or Right Brain?



# Dueling Perspectives

- Numbers people believe that valuation should be about numbers and that narratives/stories are distractions that bring in irrationalities into investing.
- Narratives people believe that valuation and investing is really about great stories and that it is the height of hubris to try to estimate numbers, when you face uncertainty.

# The delusions of the number crunchers

- The illusion of precision: If you use numbers, you are being more precise than when you don't, and the more numbers you use, the more precise you become.
- The illusion of "no bias": Numbers don't lie and data does not have an agenda. Thus, analysts who use numbers are more likely to be unbiased.
- The illusion of control: If you put a number on something (your cash flows, expected growth rate, risk etc.), you can control it better.

# The delusions of the story tellers

1. Number crunchers don't dream in technicolour: Creativity and Numbers are mutually exclusive. If you talk about numbers, you cannot be creative, and if you are being creative, talk about numbers only crimps your creative instincts.
2. Creativity is deserving of reward: If your story is good, your business will success and your investment will pay off.
3. Experience is the best teacher: If you have pulled this off before (started and succeeded at running a business), your story is more believable.

# Bridging the Gap

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

**A Good Valuation**

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

The Numbers People ⟷ The Narrative People

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

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

# FROM NARRATIVE TO NUMBERS: THE MECHANICS

# 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.

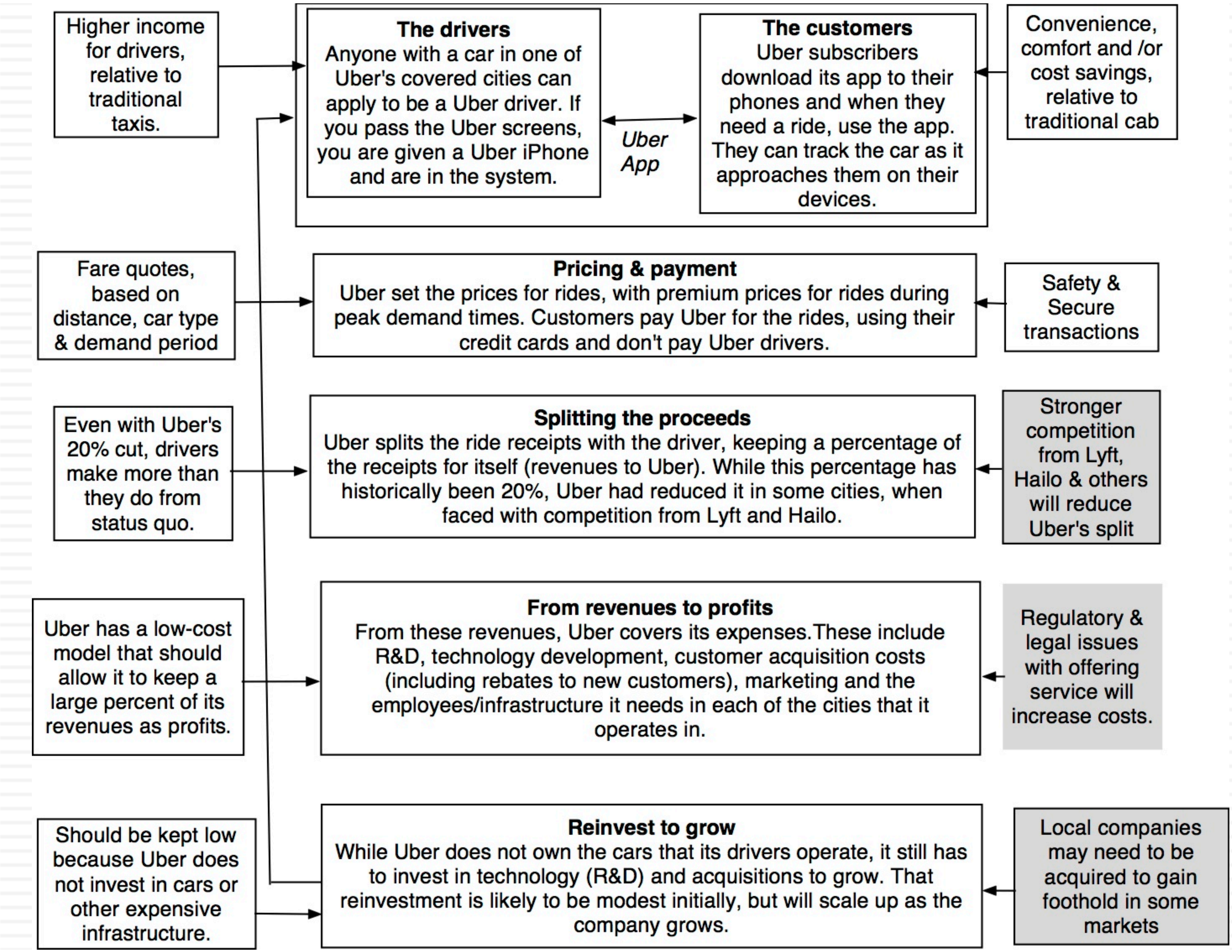
**Step 3: Convert the narrative into drivers of value**
Take the narrative apart and look at how you will bring it into valuaton inputs starting with potential market size down to cash flows and risk. By the time you are done, each part of the narrative should have a place in your numbers and each number 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 1: Survey the landscape

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


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

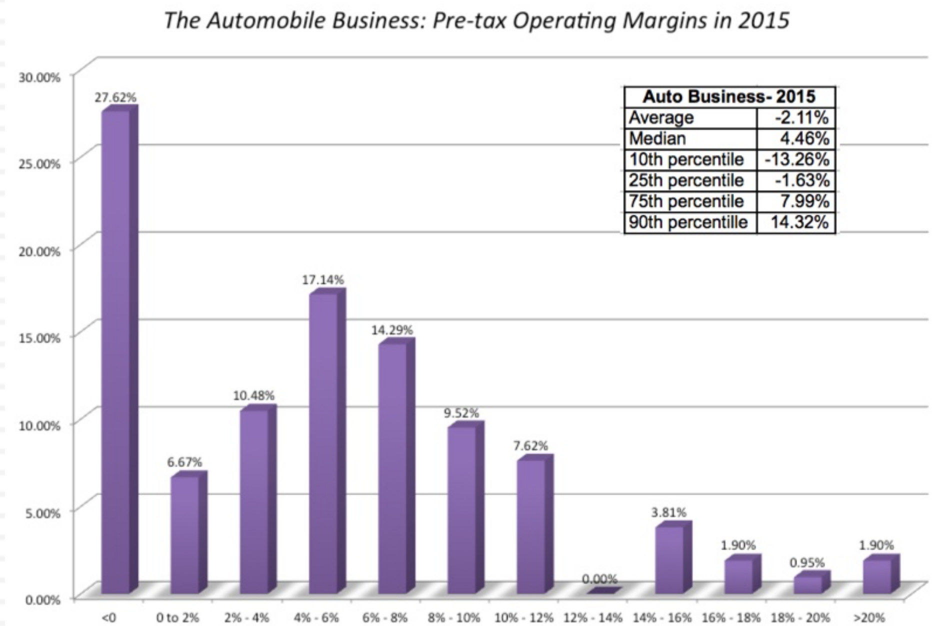
# *The Auto Business*

## Low Growth

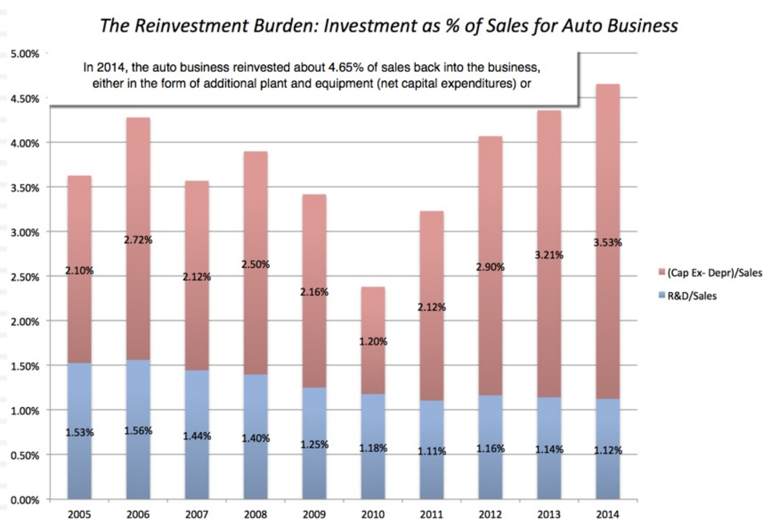
| Year | Revenues ($) | % Growth Rate |
|---|---|---|
| 2005 | 1,274,716.60 | |
| 2006 | 1,421,804.20 | 11.54% |
| 2007 | 1,854,576.40 | 30.44% |
| 2008 | 1,818,533.00 | -1.94% |
| 2009 | 1,572,890.10 | -13.51% |
| 2010 | 1,816,269.40 | 15.47% |
| 2011 | 1,962,630.40 | 8.06% |
| 2012 | 2,110,572.20 | 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




=

## 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% |

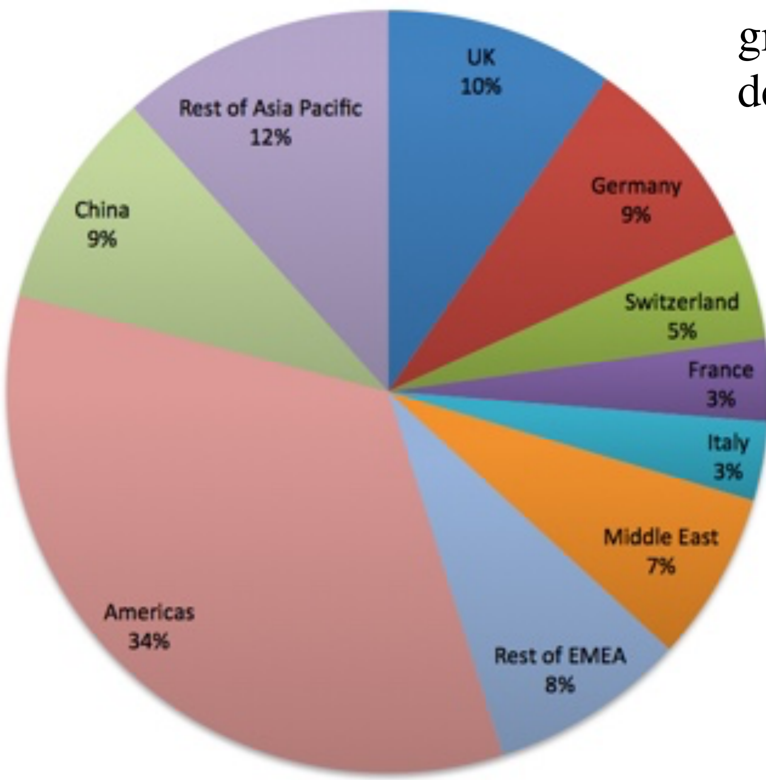
Only once in the last 10 years have auto companies collectively earned more than their cost of capital

# What makes Ferrari different?

Ferrari sold only 7,255 cars in all of 2014

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: Geographical Sales (2014)

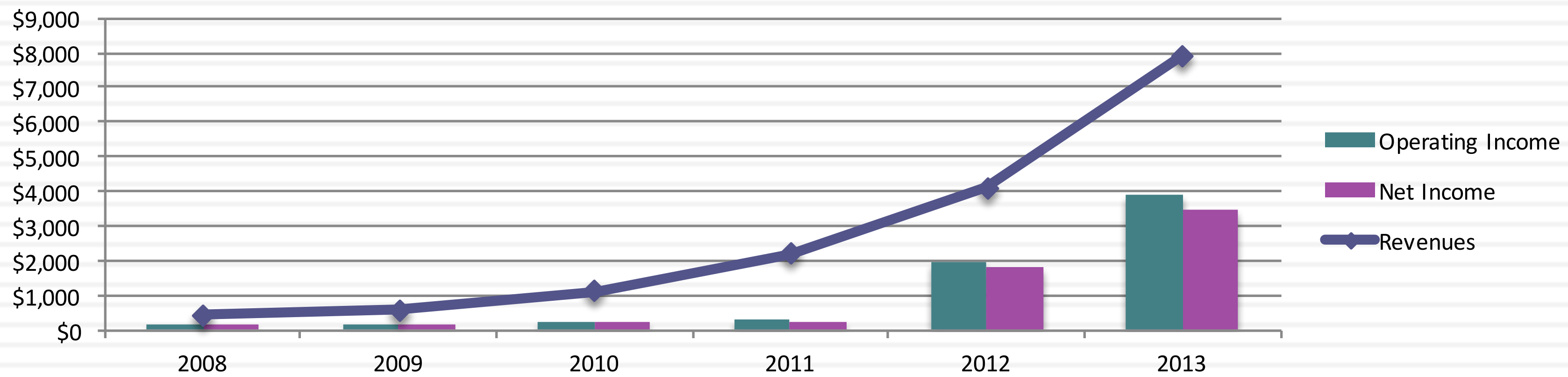



Ferrari sales (in units) have grown very little in the last decade & have been stable

Ferrari has not invested in new plants.

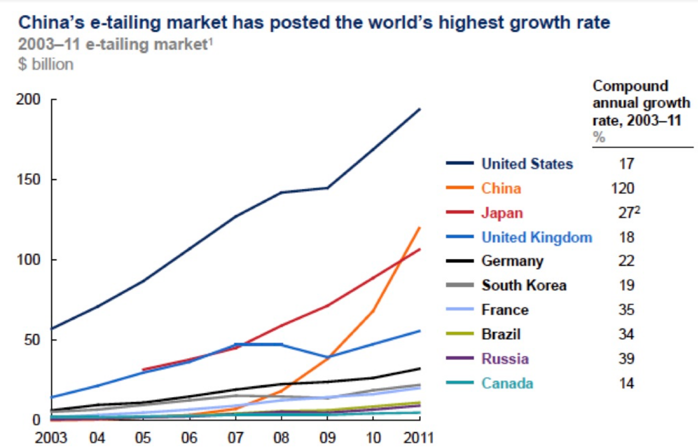
# Alibaba: The Rocket takes off..

*Figure 6.5: Alibaba- The rocket takes off!*




## Market Domination

| | B2C | | C2C | | Mobile | | Online Payment |
|---|---|---|---|---|---|---|---|
| **Tmall** | **49.08%** | **TaoBao** | **92.59%** | **TaoBao** | **81.45%** | **Alipay** | **49%** |
| JingDong | 18.16% | Paipai | 5.56% | JingDong | 6.67% | Tenpay | 20% |
| Tencent B2C | 5.68% | Eachnet | 1.85% | Maimaibao | 1.11% | Unionpay | 10% |
| Suning | 4.30% | | | Suning | 1.01% | Others | 21% |
| Amazon China | 2.72% | | | Amazon | 0.84% | | |
| Dangdang | 2.12% | | | Others | 8.92% | | |
| Others | 17.94% | | | | | | |




In the fastest growing market in the world

# Step 2: Create a narrative for the future

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

# The Uber Narrative

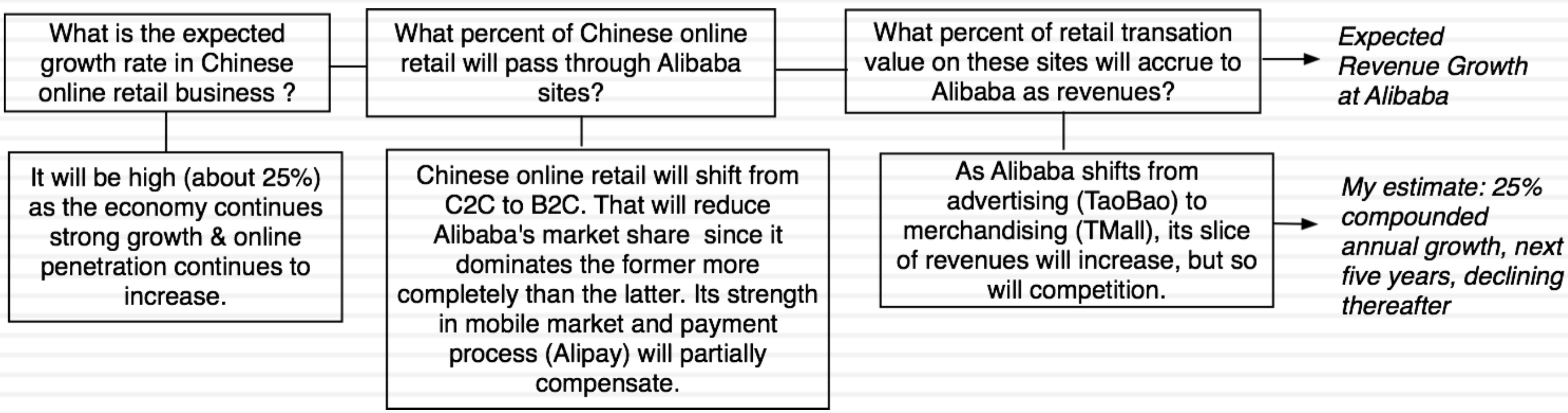
In June 2014, my initial narrative for Uber was that it would be

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

# The Ferrari Narrative

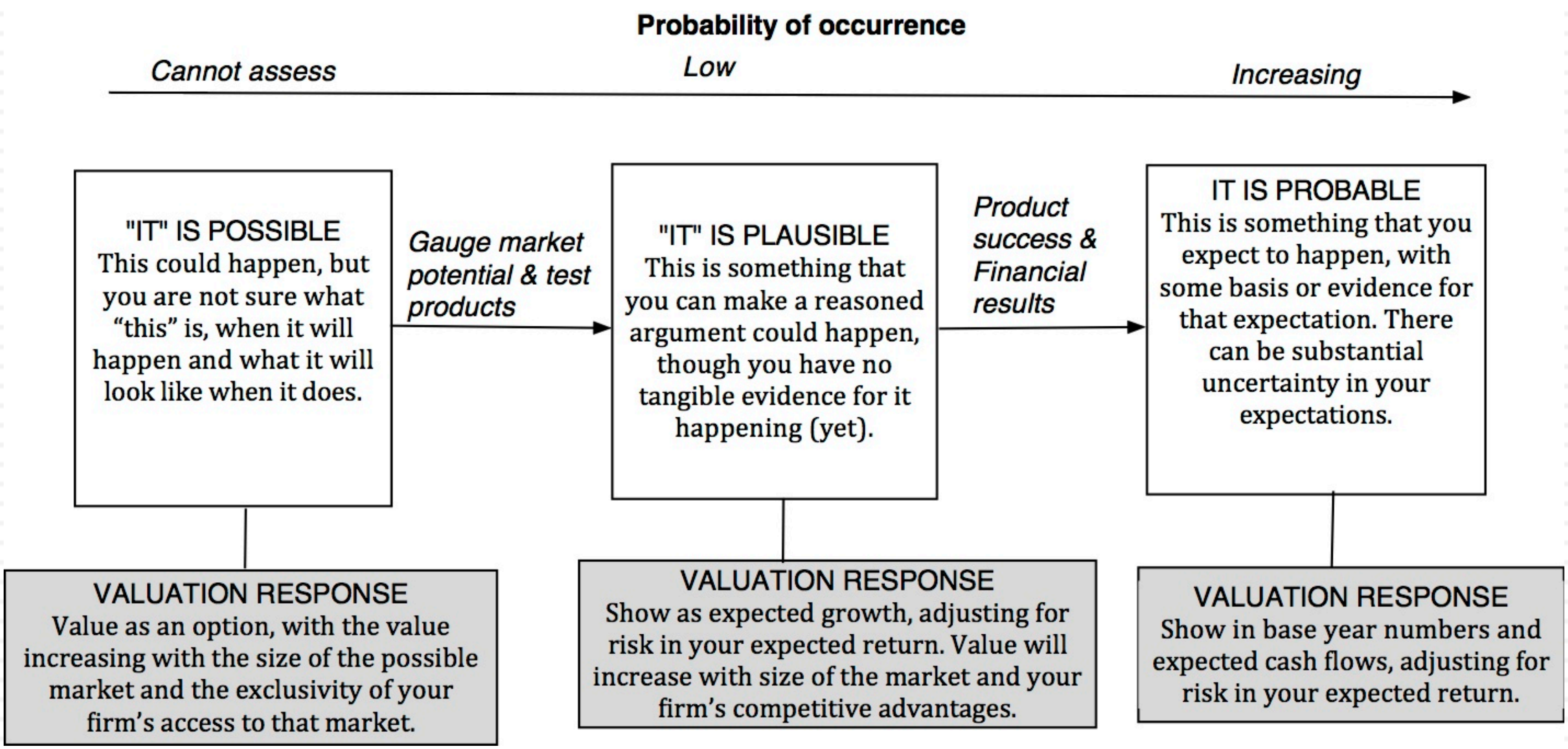
- Ferrari will stay an exclusive auto club, deriving its allure from its scarcity and the fact that only a few own Ferraris.
- By staying exclusive, the company gets three benefits:
  - It can continue to charge nose bleed prices for its cars and sell them with little or no advertising.
  - It does not 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.

# The Alibaba Narrative: The China Story



# Step 3: 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.

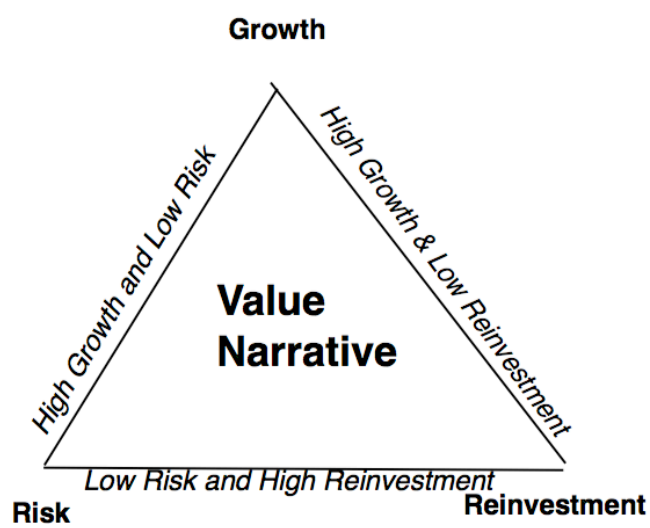
### The Implausible

**Growth without reinvestment**
Assuming growth forever without reinvestment.

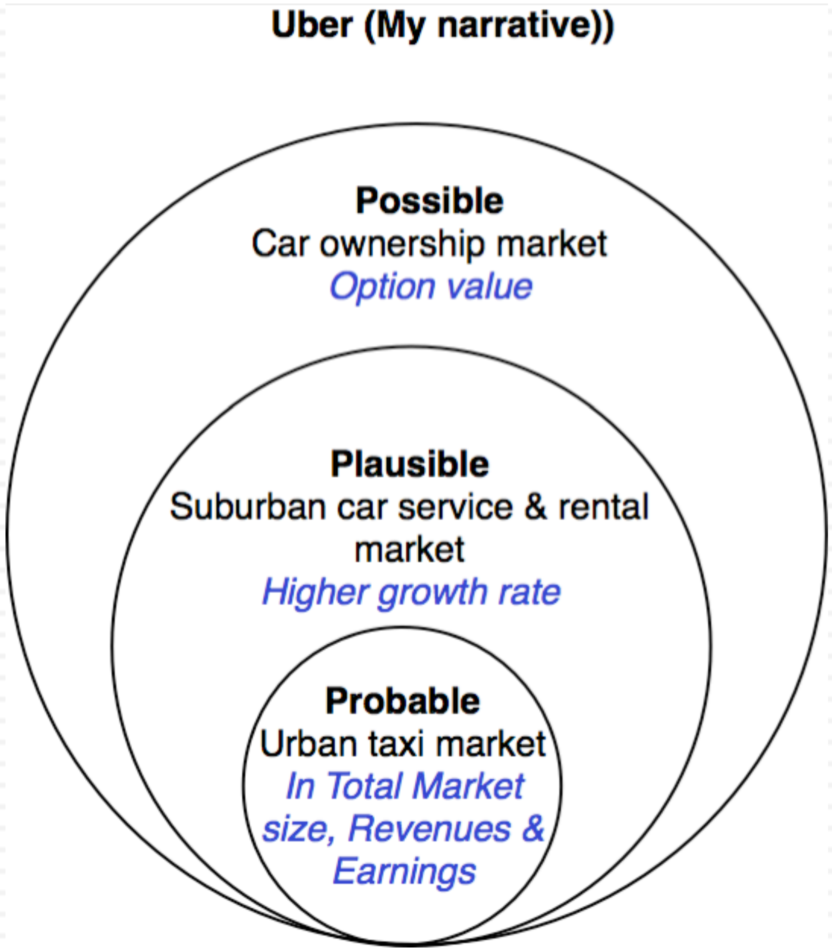
**Profits without competition**
Assuming that your company will grow and earn higher profits, with no competition.

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

### The Improbable



# Uber: Possible, Plausible and Probable



# The Impossible: The Runaway Story

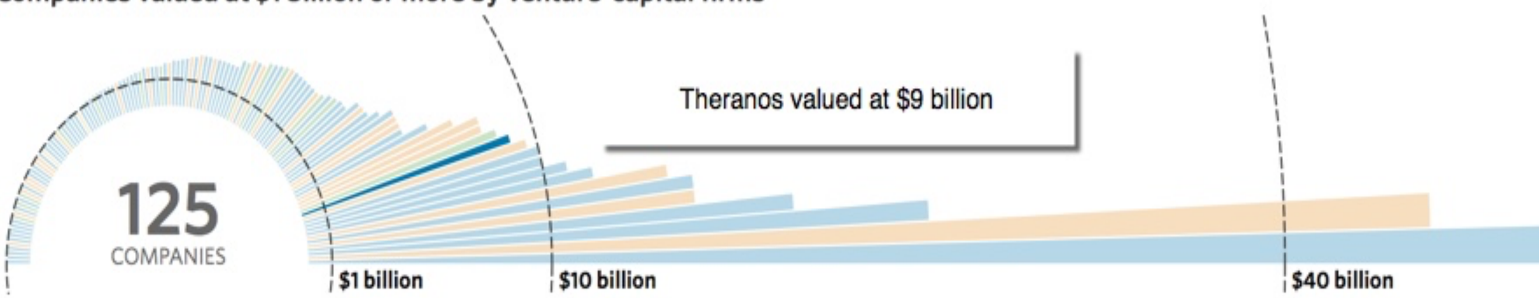
The Story

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 | Epidemiologist | 79 |
| Elizabeth Holmes | Founder & CEO, Theranos | 31 |
| Sunny Balwani | President & COO, Theranos | NA |

Money

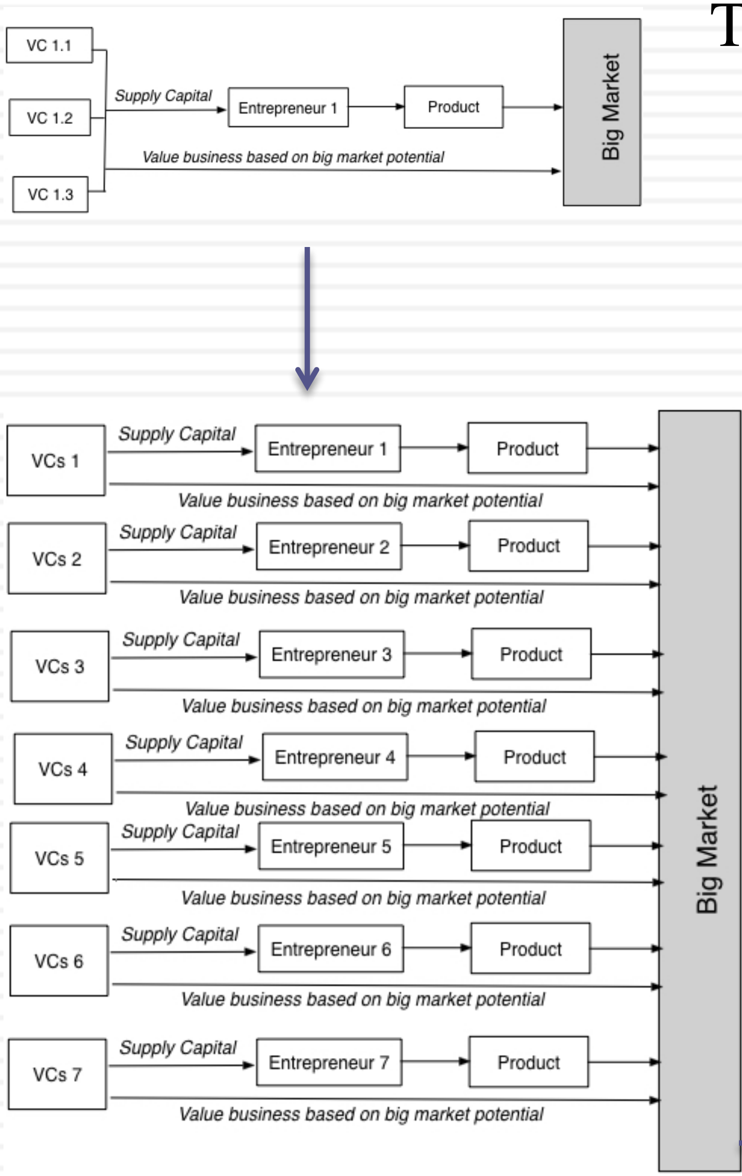
Companies valued at $1 billion or more by venture-capital firms




Valuations as of **October 2015**

*Select companies from the chart or table for more detail.*

# The Implausible: The Big Market Delusion




| *Company* | *Market Cap* | *Enterprise Value* | *Current Revenues* | *Breakeven Revenues (2025)* | *% from Online Advertising* | *Imputed Online Ad Revenue (2025)* |
|---|---|---|---|---|---|---|
| Google | $441,572.00 | $386,954.00 | $69,611.00 | $224,923.20 | 89.50% | $201,306.26 |
| Facebook | $245,662.00 | $234,696.00 | $14,640.00 | $129,375.54 | 92.20% | $119,284.25 |
| Yahoo! | $30,614.00 | $23,836.10 | $4,871.00 | $25,413.13 | 100.00% | $25,413.13 |
| LinkedIn | $23,265.00 | $20,904.00 | $2,561.00 | $22,371.44 | 80.30% | $17,964.26 |
| Twitter | $16,927.90 | $14,912.90 | $1,779.00 | $23,128.68 | 89.50% | $20,700.17 |
| Pandora | $3,643.00 | $3,271.00 | $1,024.00 | $2,915.67 | 79.50% | $2,317.96 |
| Yelp | $1,765.00 | $0.00 | $465.00 | $1,144.26 | 93.60% | $1,071.02 |
| Zillow | $4,496.00 | $4,101.00 | $480.00 | $4,156.21 | 18.00% | $748.12 |
| Zynga | $2,241.00 | $1,142.00 | $752.00 | $757.86 | 22.10% | $167.49 |
| **Total US** | **$770,185.90** | **$689,817.00** | **$96,183.00** | **$434,185.98** | | **$388,972.66** |
| Alibaba | $184,362.00 | $173,871.00 | $12,598.00 | $111,414.06 | 60.00% | $66,848.43 |
| Tencent | $154,366.00 | $151,554.00 | $13,969.00 | $63,730.36 | 10.50% | $6,691.69 |
| Baidu | $49,991.00 | $44,864.00 | $9,172.00 | $30,999.49 | 98.90% | $30,658.50 |
| Sohu.com | $18,240.00 | $17,411.00 | $1,857.00 | $16,973.01 | 53.70% | $9,114.51 |
| Naver | $13,699.00 | $12,686.00 | $2,755.00 | $12,139.34 | 76.60% | $9,298.74 |
| Yandex | $3,454.00 | $3,449.00 | $972.00 | $2,082.52 | 98.80% | $2,057.52 |
| Yahoo! Japan | $23,188.00 | $18,988.00 | $3,591.00 | $5,707.61 | 69.40% | $3,961.08 |
| Sina | $2,113.00 | $746.00 | $808.00 | $505.09 | 48.90% | $246.99 |
| Netease | $14,566.00 | $11,257.00 | $2,388.00 | $840.00 | 11.90% | $3,013.71 |
| Mail.ru | $3,492.00 | $3,768.00 | $636.00 | $1,676.47 | 35.00% | $586.76 |
| Mixi | $3,095.00 | $2,661.00 | $1,229.00 | $777.02 | 96.00% | $745.94 |
| Kakaku | $3,565.00 | $3,358.00 | $404.00 | $1,650.49 | 11.60% | $191.46 |
| **Total non-US** | **$474,131.00** | **$444,613.00** | **$50,379.00** | **$248,495.46** | | **$133,415.32** |
| **Global Total** | **$1,244,316.90** | **$1,134,430.00** | **$146,562.00** | **$682,681.44** | | **$522,387.98** |

# The Improbable: Willy Wonkitis

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

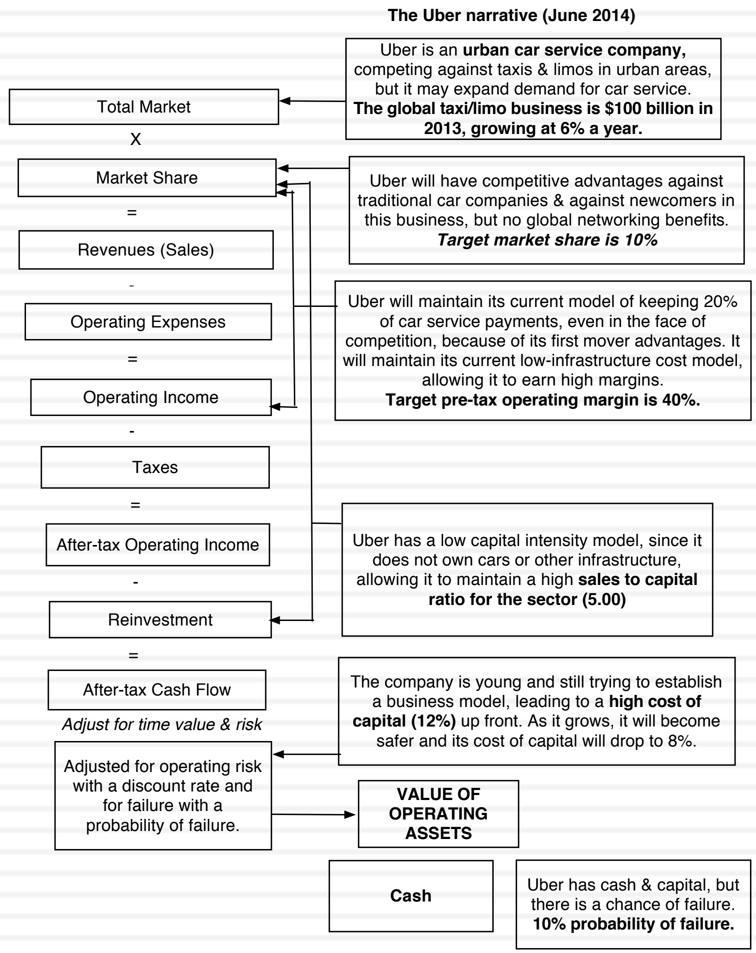
| | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Volume | 24,298 | 36,883 | 64,684 | 86,713 | 149,869 | 214,841 | 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) |

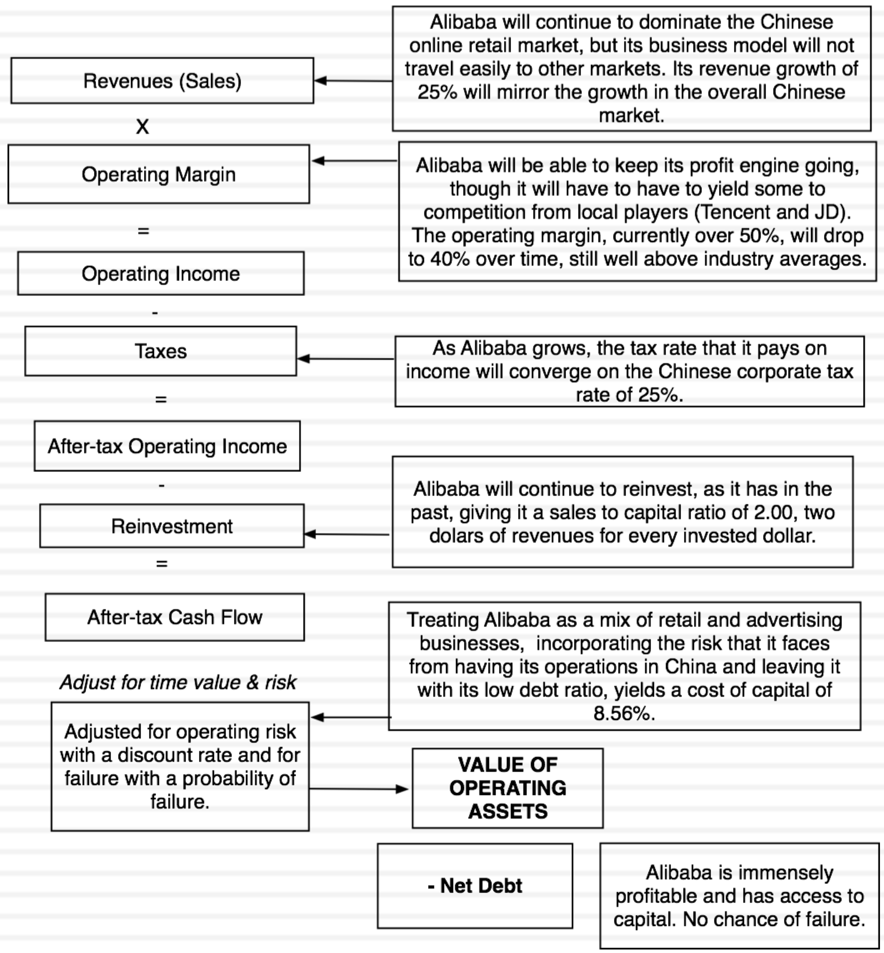
# Step 4: Connect your narrative to key drivers of value



# Ferrari: From story to numbers

| *Valuation Input* | *The Story* | *Valuation Inputs* |
|---|---|---|
| Revenues | *Keep it scarce* | Revenue growth of 4% (in Euro terms) a year for next 5 years, scaling down to 0.7% in year 10. Translates into an increase in production of about 25% in next 10 years |
| *Operating Margin & Taxes* | | |
| Operating Income | *And pricey* | Ferrari's pre-tax operating margin stays at 18.2%, in the 95th percentile of auto business. |
| *Reinvestment* | *Little need for capacity expansion* | Sales/Invested Capital stays at 1.42, i.e. every euro invested generates 1.42 euros in sales |
| Cash Flow | | |
| *Discount Rate (Risk)* | *Super-rich clients are recession-proof* | Cost of capital of 6.96% in Euros and no chance of default. |

# The Alibaba Revenue/Margin Inputs



# Step 4: Value the company (Uber)



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

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

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

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

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

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

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

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

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

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

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

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

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

**Value of operating assets = $6,595**

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

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

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

# 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

## *Alibaba, the China Story (September 2014, just before IPO)*

Alibaba will stay China-centric, maintaining its high market share and growing with the Chinese online retail market. It's margins will come down becaue of competition but still stay high.

| | T12M | 2012-13 |
|---|---|---|
| Revenues | \$9,268 | \$4,821 |
| Operating Income | \$4,702 | \$1,777 |
| Effective tax rate | 11.92% | |
| Operating Margin | 50.73% | |

Revenue growth of **25%** a year for 5 years, tapering down to 2.63% in year 10

Pre-tax operating margin decreases to 40% over time & tax rate rises to 25%

Sales to capital ratio maintained at 2.00

**Stable Growth**
g = 2.41%
Cost of capital = 8%
ROC= 8%;
Reinvestment Rate= 2.41%/8% = 30.125%

Terminal Value$_{10}$= 10,353/(.08-0241) = \$185,198

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Revenue growth rate | 25.00% | 25.00% | 25.00% | 25.00% | 25.00% | 20.48% | 15.96% | 11.45% | 6.93% | 2.41% |
| Revenues | \$ 11,585 | \$ 14,481 | \$ 18,101 | \$ 22,626 | \$ 28,283 | \$ 34,075 | \$ 39,515 | \$ 44,038 | \$ 47,089 | \$ 48,224 |
| EBIT (Operating) margi | 49.66% | 48.59% | 47.51% | 46.44% | 45.37% | 44.29% | 43.22% | 42.15% | 41.07% | 40.00% |
| EBIT (Operating incom | \$ 5,753 | \$ 7,035 | \$ 8,600 | \$ 10,507 | \$ 12,831 | \$ 15,093 | \$ 17,078 | \$ 18,560 | \$ 19,341 | \$ 19,290 |
| Tax rate | 11.92% | 11.92% | 11.92% | 11.92% | 11.92% | 14.54% | 17.15% | 19.77% | 22.38% | 25.00% |
| EBIT(1-t) | \$ 5,067 | \$ 6,197 | \$ 7,575 | \$ 9,255 | \$ 11,301 | \$ 12,899 | \$ 14,149 | \$ 14,891 | \$ 15,012 | \$ 14,467 |
| - Reinvestment | \$ 1,158 | \$ 1,448 | \$ 1,810 | \$ 2,263 | \$ 2,828 | \$ 2,896 | \$ 2,720 | \$ 2,261 | \$ 1,525 | \$ 567 |
| FCFF | \$ 3,908 | \$ 4,749 | \$ 5,765 | \$ 6,992 | \$ 8,473 | \$ 10,002 | \$ 11,429 | \$ 12,630 | \$ 13,486 | \$ 13,900 |

| | |
|---|---|
| Operating assets | \$137,386 |
| + Cash | 9330 |
| - Debt | 10068 |
| + Equity investments | 2,087 |
| + Alipay provision | 3,000 |
| + IPO Proceeds (est) | 20,000 |
| - Options | 696 |
| Value of equity | 161,039 |
| Value per share | \$65.98 |

| Term yr | |
|---|---|
| EBIT (1-t) | \$14,816 |
| - Reinv | 4,463 |
| FCFF | 10,353 |

Cost of capital = 8.90% (.943) + 3.00% (.057) = 8.56%

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

**Cost of Equity**
8.90%

**Cost of Debt**
4% (1-.25) = 3.00%

**Weights**
E = 94.3% D = 5.7%

**Riskfree Rate**:
Riskfree rate = 2.41%

+

**Beta**
1.092

X

**ERP**
5.94%

Unlevered Beta: 1.044 (70% advertising, 30% online retailing)

D/E = 6.07%

| | | |
|---|---|---|
| China | 90.29% | 5.90% |
| Global | 9.71% | 6.35% |
| Alibaba | 100.00% | 5.94% |

Alibaba will continue to be in two businesses, advertising snd retailing, and retain its existing China focus.

# 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 Option

| Valuation Input | The Story | Valuation Inputs |
|---|---|---|
| Revenues | *Sales Push* | Revenue growth of 12% (in Euro terms) a year for next 5 years, scaling down to 0.7% in year 10. Translates into an increase in production of about 100% in next 10 years |
| *Operating Margin & Taxes* | | |
| Operating Income | *With lower priced models & selling costs* | Ferrari's pre-tax operating margin drops to 14.32%, in the 90th percentile of auto business. |
| *Reinvestment* | *With investments in additional capacity* | Sales/Invested Capital stays at 1.42, but higher sales create more reinvestment |
| Cash Flow | | |
| *Discount Rate (Risk)* | *Very rich are more sensitive to economic conditions* | Cost of capital of 8% in Euros and no chance of default |
| Value | | |

# 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!

# *Alibaba, the Global Story (September 2014, just before IPO)*

Alibaba is able to expand into overseas markets, allowing its revenues to grow 40% a year for the next 5 years. Its profit margins will come under pressure as it competes in foreign markets and it will need to reinvest more to grow.

| | T12M | 2012-13 |
|---|---|---|
| Revenues | $9,268 | $4,821 |
| Operating Income | $4,702 | $1,777 |
| Effective tax rate | 11.92% | |
| Operating Margin | 50.73% | |

Revenue growth of **40%** a year for 5 years, tapering down to 2.63% in year 10

Pre-tax operating margin decreases to 30% over time & tax rate rises to 25%

Sales to capital ratio will be 1.50

**Stable Growth**
g = 2.41%
Cost of capital = 8%
ROC= 8%;
Reinvestment Rate= 2.41%/8% = 30.125%

Terminal Value$_{10}$= 17,567/(.08-0241) = $314,292

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Revenue growth rate | 40.00% | 40.00% | 40.00% | 40.00% | 40.00% | 32.48% | 24.96% | 17.45% | 9.93% | 2.41% |
| Revenues | $ 12,975 | $ 18,165 | $ 25,431 | $ 35,604 | $ 49,846 | $ 66,036 | $ 82,522 | $ 96,918 | $ 106,540 | $ 109,108 |
| EBIT (Operating) margin | 48.66% | 46.58% | 44.51% | 42.44% | 40.36% | 38.29% | 36.22% | 34.15% | 32.07% | 30.00% |
| EBIT (Operating income) | $ 6,313 | $ 8,462 | $ 11,320 | $ 15,110 | $ 20,120 | $ 25,287 | $ 29,888 | $ 33,094 | $ 34,171 | $ 32,732 |
| Tax rate | 11.92% | 11.92% | 11.92% | 11.92% | 11.92% | 14.54% | 17.15% | 19.77% | 22.38% | 25.00% |
| EBIT(1-t) | $ 5,561 | $ 7,453 | $ 9,970 | $ 13,308 | $ 17,721 | $ 21,611 | $ 24,762 | $ 26,552 | $ 26,522 | $ 24,549 |
| - Reinvestment | $ 2,471 | $ 3,460 | $ 4,844 | $ 6,782 | $ 9,494 | $ 10,794 | $ 10,990 | $ 9,598 | $ 6,415 | $ 1,712 |
| FCFF | $ 3,089 | $ 3,993 | $ 5,126 | $ 6,527 | $ 8,227 | $ 10,817 | $ 13,772 | $ 16,954 | $ 20,107 | $ 22,838 |

| Term yr | |
|---|---|
| EBIT (1-t) | $25,141 |
| - Reinv | 7,574 |
| FCFF | 17,567 |

| | |
|---|---|
| Operating assets | $ 202,186 |
| + Cash | 9330 |
| - Debt | 10068 |
| + Equity investments | 2,087 |
| + Alipay provision | 3,000 |
| + IPO Proceeds (est) | 20,000 |
| - Options | 696 |
| Value of equity | 225,839 |
| Value per share | $92.52 |

Cost of capital = 9.05% (.943) + 3.00% (.057) = 8.70%

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

**Cost of Equity**
9.05%

**Cost of Debt**
4% (1-.25) = 3.00%

**Weights**
E = 94.3% D = 5.7%

**Riskfree Rate**:
Riskfree rate = 2.41%

+

**Beta**
1.092

X

**ERP**
6.08%

Unlevered Beta: 1.044 (70% advertising, 30% online retailing)

D/E = 6.07%

| *Country* | *Weight* | *ERP* |
|---|---|---|
| China | 60.00% | 5.90% |
| Global | 40.00% | 6.35% |
| Total | 100.00% | 6.08% |

Alibaba will continue to be in two businesses, advertising snd retailing, but the proportion of revenues from the rest of the globe will increase.

# Back to Amazon: An Optimistic Counter

*To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost.* Operating margin stays low for the next few years.

*Amazon will continue on its path of revenue growth first, pushing **strongly** into media & cloud servies to become the second largest retailer in the world.* Revenues grow @20% a year for 5 years, tapering down to 2.2% growth after year 10

*As Amazon becomes more dominant, it will increase prices, **with few restraints**.* Operating margin improves to 12.84% in year 10, the 75th percentile of retail & media businesses

| | *Base year* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | Terminal year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue growth rate | | 20.00% | 20.00% | 20.00% | 20.00% | 20.00% | 16.44% | 12.88% | 9.32% | 5.76% | 2.20% | 2.20% |
| Revenues | $ 85,246 | $102,295 | $122,754 | $147,305 | $176,766 | $212,119 | $246,992 | $278,804 | $304,789 | $322,345 | $329,436 | $ 336,684 |
| EBIT (Operating) margin | 0.47% | 1.71% | 2.94% | 4.18% | 5.42% | 6.65% | 7.89% | 9.13% | 10.37% | 11.60% | 12.84% | 12.84% |
| EBIT (Operating income) | $ 400 | $ 1,746 | $ 3,613 | $ 6,158 | $ 9,576 | $ 14,116 | $ 19,492 | $ 25,451 | $ 31,594 | $ 37,401 | $ 42,300 | $ 43,230 |
| Tax rate | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% |
| EBIT(1-t) | $ 273 | $ 1,190 | $ 2,464 | $ 4,200 | $ 6,531 | $ 9,627 | $ 13,293 | $ 17,358 | $ 21,547 | $ 25,508 | $ 28,848 | $ 29,483 |
| - Reinvestment | | $ 4,632 | $ 5,559 | $ 6,670 | $ 8,004 | $ 9,605 | $ 9,475 | $ 8,643 | $ 7,060 | $ 4,770 | $ 1,927 | $ 5,405 |
| FCFF | | -$ 3,442 | -$ 3,094 | -$ 2,470 | -$ 1,473 | $ 22 | $ 3,819 | $ 8,715 | $ 14,487 | $ 20,738 | $ 26,922 | $ 24,078 |
| | | | | | | | | | | | | |
| Cost of capital | | 8.39% | 8.39% | 8.39% | 8.39% | 8.39% | 8.32% | 8.24% | 8.16% | 8.08% | 8.00% | 8.00% |
| Cumulated discount factor | | 0.9226 | 0.8511 | 0.7852 | 0.7244 | 0.6683 | 0.6170 | 0.5700 | 0.5271 | 0.4877 | 0.4515 | |
| PV(FCFF) | | $3,175 | $2,634 | $1,940 | $1,067 | $15 | $2,356 | $4,968 | $7,636 | $10,113 | $12,156 | |

*Amazon will be able to invest more efficiently than the average retailer.* Reinvest $1 for every $3.68 in additional revenues

| | |
|---|---|
| Terminal value | $415,134.21 |
| PV(Terminal value) | $187,447.77 |
| PV (CF over next 10 years) | $ 28,427.49 |
| Value of operating assets = | $215,875.26 |
| - Debt | $ 9,201.58 |
| + Cash | $ 10,252.00 |
| + Non-operating assets | $ - |
| Value of equity | $216,925.67 |
| - Value of options | $ - |
| Value of equity in common stock | 216,925.67 |
| Number of shares | 463.01 |
| Estimated value /share | $ 468.51 |

*Amazon's technology twist will keep financial leverage low*: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

*Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions*: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

***Amazon: An Optimistic (Conspiratorial) Valuation in late October 2014***

# And a pessimistic one..

*To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost.* Operating margin stays low for the next few years.

*Amazon will continue on its path of revenue growth first, pushing into media & cloud servies to become the second largest retailer in the world.* Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

*Easy entry into the business will push margins down for everyone:* Operating margin stays at 2.85% in year 10, in the 25th percentile of retail company margins

*Amazon will be able to invest more efficiently that the average retailer.* Reinvest $1 for every $3.68 in additional revenues

| | *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% | 12.44% | 9.88% | 7.32% | 4.76% | 2.20% | 2.20% |
| Revenues | $ 85,246 | $ 98,033 | $ 112,738 | $ 129,649 | $ 149,096 | $ 171,460 | $ 192,790 | $ 211,837 | $227,344 | $238,166 | $ 243,405 | $ 248,760 |
| EBIT (Operating) margin | 0.47% | 0.71% | 0.95% | 1.18% | 1.42% | 1.66% | 1.90% | 2.14% | 2.37% | 2.61% | 2.85% | 2.85% |
| EBIT (Operating income) | $ 400 | $ 693 | $ 1,066 | $ 1,534 | $ 2,120 | $ 2,846 | $ 3,659 | $ 4,524 | $ 5,397 | $ 6,221 | $ 6,937 | $ 7,090 |
| Tax rate | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% | 31.80% |
| EBIT(1-t) | $ 273 | $ 473 | $ 727 | $ 1,046 | $ 1,446 | $ 1,941 | $ 2,495 | $ 3,086 | $ 3,681 | $ 4,243 | $ 4,731 | $ 4,835 |
| - Reinvestment | | $ 3,474 | $ 3,995 | $ 4,594 | $ 5,284 | $ 6,076 | $ 5,795 | $ 5,175 | $ 4,213 | $ 2,940 | $ 1,424 | $ 1,064 |
| FCFF | | $ (3,001) | $ (3,268) | $ (3,548) | $ (3,838) | $ (4,136) | $ (3,300) | $ (2,089) | $ (532) | $ 1,302 | $ 3,307 | $ 3,771 |
| | | | | | | | | | | | | |
| Cost of capital | | 8.39% | 8.39% | 8.39% | 8.39% | 8.39% | 8.32% | 8.24% | 8.16% | 8.08% | 8.00% | 8.00% |
| Cumulated discount factor | | 0.9226 | 0.8511 | 0.7852 | 0.7244 | 0.6683 | 0.6170 | 0.5700 | 0.5271 | 0.4877 | 0.4515 | |
| PV(FCFF) | | -$2,768.76 | -$2,781.71 | -$2,785.95 | -$2,780.38 | -$2,763.78 | -$2,036.06 | -$1,191.09 | -$ 280.58 | $ 635.12 | $1,493.45 | |

| | |
|---|---|
| PV(Terminal value) | $29,361 |
| PV (CF over next 10 years) | $15,260 |
| Value of operating assets = | $14,101 |
| - Debt | $9,202 |
| + Cash | $10,252 |
| Value of equity | $15,151 |
| - Value of options | $0 |
| Value of equity in common stock | $ 15,151 |
| Number of shares | 463.01 |
| Estimated value /share | $ 32.72 |

*Amazon's technology twist will keep financial leverage low*: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

*Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions*: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and businesss services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

***Amazon: The Doomsday in late October 2014***

# Narrative breaks, shifts & changes

"When my information changes, I alter my conclusions. What do you do, sir?"

*Lord Keynes*

# Why narratives change

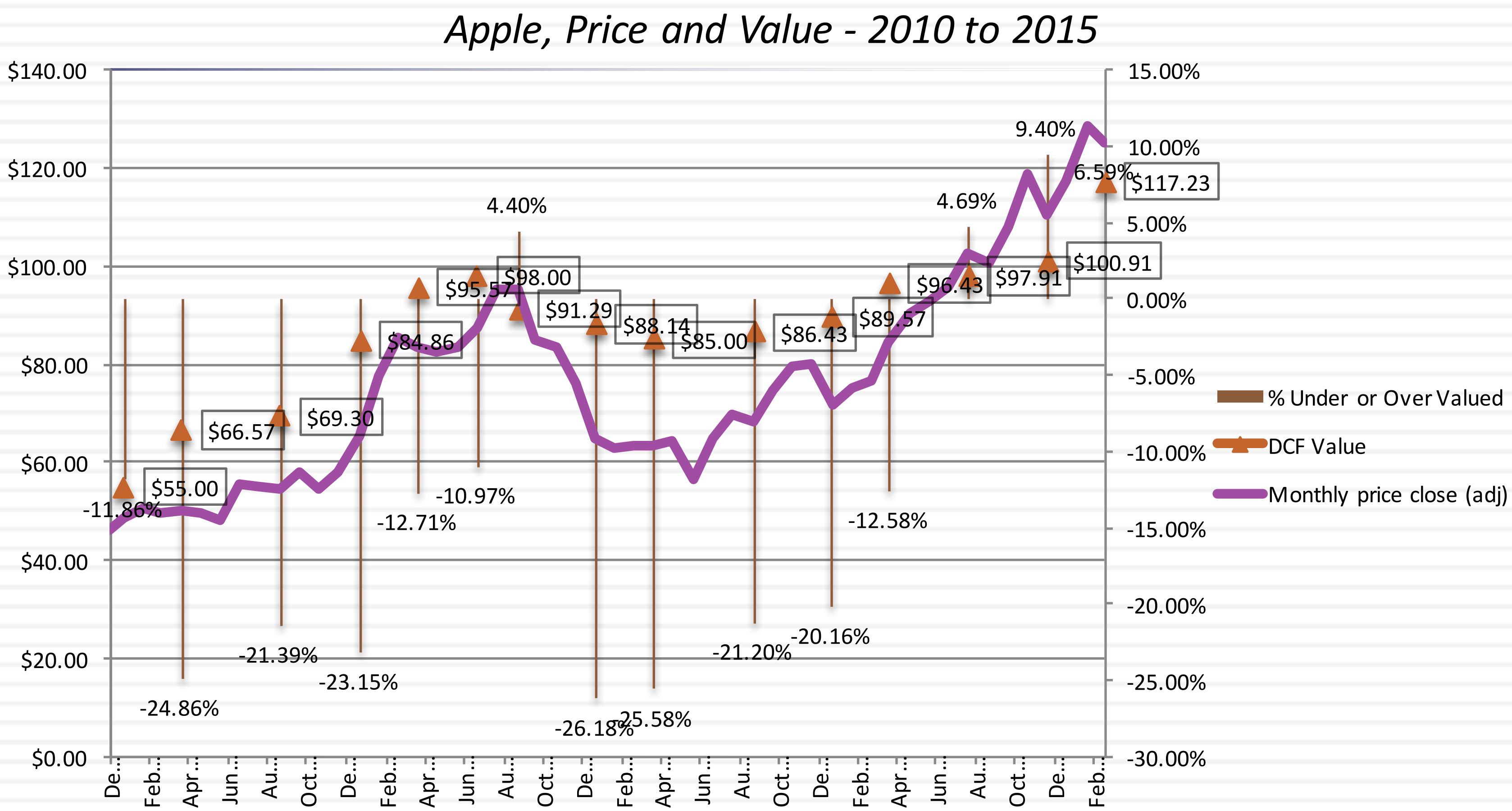
1. Earnings reports: Every earnings announcement from a firm is a chance to reassess the narrative about the firm.
2. Corporate actions: Any action that changes the basic construct for the firm, including divestitures, acquisitions and splits offs.
3. Management change: A new CEO, board of directors or other significant management change.
4. Macroeconomic changes: A change in the macroeconomic environment, leading to shifts in interest rates, inflation, exchange rates or other variables.
5. Political changes: A change in government, political system or any structural shift.

# 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 |

# Uber: The September 2015 Update

| *Input* | *June 2014* | *September 2015* | *Rationale* |
|---|---|---|---|
| Total Market | $100 billion; Urban car service | $230 billion; Logistics | Market is broader, bigger & more global than I thought it would be. Uber's entry into delivery & moving businesses is now plausible, perhaps even probable. |
| Growth in market | Increase market size by 34%; CAGR of 6%. | Double market size; CAGR of 10.39%. | New customers being drawn to car sharing, with more diverse offerings. |
| Market Share | 10% (Local Networking) | 25% (Weak Global Networking) | Higher cost of entry will reduce competitors, but remaining competitors have access to capital & in Asia, the hometown advantage. |
| Slice of gross receipts | 20% (Left at status quo) | 15% | Increased competition will reduce car service company slice. |
| Operating margin | 40% (Low cost model) | 25% (Partial employee model) | Drivers will become partial employees, higher insurance and regulatory costs. |
| Cost of capital | 12% (Ninth decile of US companies) | 10% (75th percentile of US companies) | Business model in place and substantial revenues. |
| Probability of failure | 10% | 0% | Enough cash on hand to find off threats to survival. |
| **Value of equity** | **$5.9 billion** | **$23.4 billion** | **Value increased more than four fold.** |

| Potential Market | Market size (in millions) |
|---|---|
| A1. Urban car service | $100,000 |
| A2. All car service | $175,000 |
| A3. Logistics | $230,000 |
| A4. Mobility Services | $310,000 |

| Growth Effect | CAGR (next 10 years) |
|---|---|
| B1. None | 3.00% |
| B2. Increase market by 25% | 5.32% |
| B3. Increase market size by 50% | 7.26% |
| B4: Double market size | 10.39% |

Increases overall market to $618 billion in year 10

| Network Effects | Market Share |
|---|---|
| C1. No network effects | 5% |
| C2. Weak local network effects | 10% |
| C3. Strong local network effects | 15% |
| C4. Weak global network effects | 25% |
| C5. Strong global network effects | 40% |

| | Base | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Assumptions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall market | $230,000 | $253,897 | $280,277 | $309,398 | $341,544 | $377,031 | $416,204 | $459,448 | $507,184 | $559,881 | $618,052 | A3 & B4 |
| Share of market (gross) | 4.71% | 6.74% | 8.77% | 10.80% | 12.83% | 14.86% | 16.89% | 18.91% | 20.94% | 22.97% | 25.00% | C4 |
| Gross Billings | $10,840 | $17,117 | $24,582 | $33,412 | $43,813 | $56,014 | $70,277 | $86,900 | $106,218 | $128,612 | $154,513 | |
| Revenues as percent of gross | 20.00% | 19.50% | 19.00% | 18.50% | 18.00% | 17.50% | 17.00% | 16.50% | 16.00% | 15.50% | 15.00% | D3 |
| Annual Revenue | $2,168 | $3,338 | $4,670 | $6,181 | $7,886 | $9,802 | $11,947 | $14,338 | $16,995 | $19,935 | $23,177 | |
| Operating margin | -23.06% | -18.26% | -13.45% | -8.64% | -3.84% | 0.97% | 5.77% | 10.58% | 15.39% | 20.19% | 25.00% | E2 |
| Operating Income | -$500 | -$609 | -$628 | -$534 | -$303 | $95 | $690 | $1,517 | $2,615 | $4,026 | $5,794 | |
| Effective tax rate | 30.00% | 31.00% | 32.00% | 33.00% | 34.00% | 35.00% | 36.00% | 37.00% | 38.00% | 39.00% | 40.00% | |
| - Taxes | -$150 | -$189 | -$201 | -$176 | -$103 | $33 | $248 | $561 | $994 | $1,570 | $2,318 | |
| After-tax operating income | -$350 | -$420 | -$427 | -$358 | -$200 | $62 | $442 | $956 | $1,621 | $2,456 | $3,477 | |
| Sales/Capital Ratio | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | F |
| - Reinvestment | | $234 | $267 | $302 | $341 | $383 | $429 | $478 | $531 | $588 | $648 | |
| Free Cash Flow to the Firm | | -$654 | -$694 | -$660 | -$541 | -$322 | $13 | $478 | $1,090 | $1,868 | $2,828 | |
| Terminal value | | | | | | | | | | | $56,258 | |
| Present value of FCFF | | -$595 | -$573 | -$496 | -$369 | -$200 | $7 | $248 | $520 | $822 | $1,152 | |
| Present value of terminal value | | | | | | | | | | | $22,914 | |
| Cost of capital | 10.00% | 10.00% | 10.00% | 10.00% | 10.00% | 10.00% | 9.60% | 9.20% | 8.80% | 8.40% | 8.00% | G1 |

| | | |
|---|---|---|
| PV of cash flows during next 10 years = | $515 | |
| PV of terminal value = | $22,914 | |
| Value of operating assets | $23,429 | |
| Probability of failure | 0.00% | G2 |
| Adjusted value of operating assets | $23,429 | |
| Less Debt | $0 | |
| Value of Equity | $23,429 | |

**Capital Intensity**
F: Status Quo: Sales/Capital = 5

| Expense Profile | Operating Margin |
|---|---|
| E1: Independent contractor | 40% |
| E2: Partial employee | 25% |
| E3: Full employee | 15% |

| Competitive Advantages | Slice of Gross Receipts |
|---|---|
| D1. None | 5% |
| D2. Weak | 10% |
| D3. Semi-strong | 15% |
| D4. Strong & Sustainable | 20% |

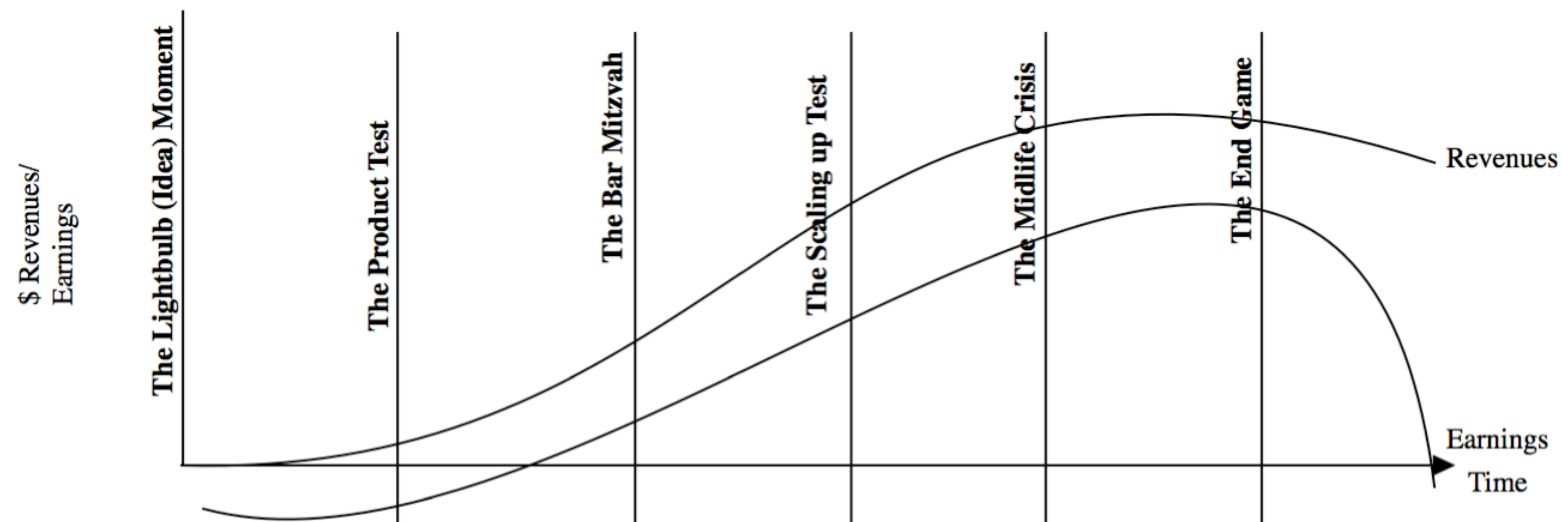
**Risk Estimates**
G1. Cost of capital at 75th percentile of US companies = 10%
G2. Probability of failure in next 10 years= 0%

# Uber Valuation: September 2015

# Investors and Managers: Narrative or Numbers?

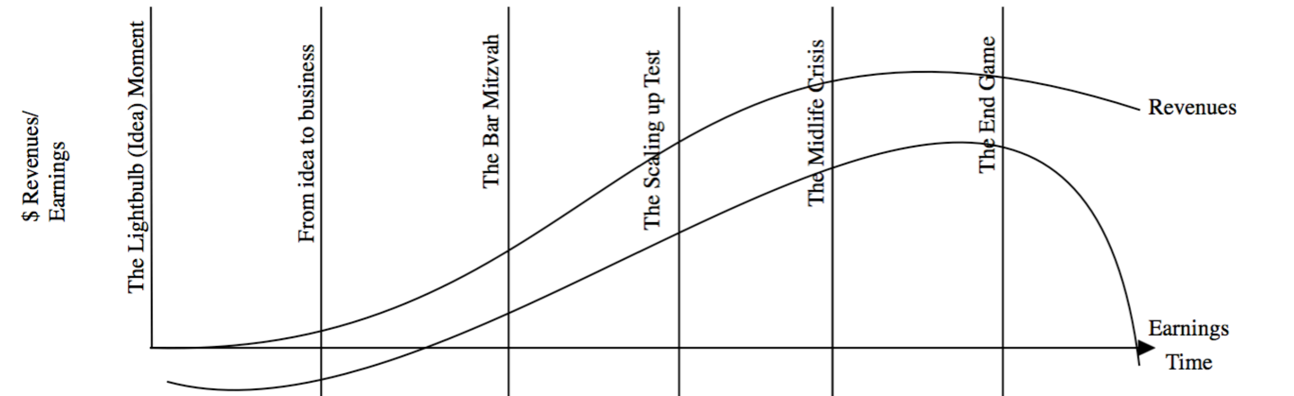
"Management is, above all, a practice where art, science, and craft meet"

# Introducing the corporate life cycle




| | | | | | | |
|---|---|---|---|---|---|---|
| ***Growth stage*** | Stage 1<br>Start-up | Stage 2<br>Young Growth | Stage 3:<br>High Growth | Stage 4<br>Mature Growth | Stage 5<br>Mature Stable | Stage 6<br>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. |

# The Managerial Challenge




| | | | | | | |
|---|---|---|---|---|---|---|
| *Growth Stage* | Stage 1<br>Start-up | Stage 2<br>Young Growth | Stage 3:<br>High Growth | Stage 4<br>Mature Growth | Stage 5<br>Mature Stable | Stage 6<br>Decline |
| *All Narrative* → All Numbers | | | | | | |
| *The Top Management's Job* | Tell a compelling and plausible story with potential for huge profits | Stay consistent in word & actions with your story | Start delivering numbers to back up the story | Keep your narrative in sync with your numbers | Adjust your narrative to reflect where you are in the life cycle. | Act your age (in terms of narrative & choices) |
| *Management Importance* | High → Low | | | | | |
| *The Right CEO* | The Visionary | The Builder | The Opportunist | The Defender | The Realist | The Liquidator |

# 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* |

# The End

“There is no real ending. It’s just the place where you stop the story.”