# A VALUATION JOURNEY: LESSONS LEARNED AND UNLEARNED

October 2022

Aswath Damodaran

# I. Don't assume that D+CF = DCF



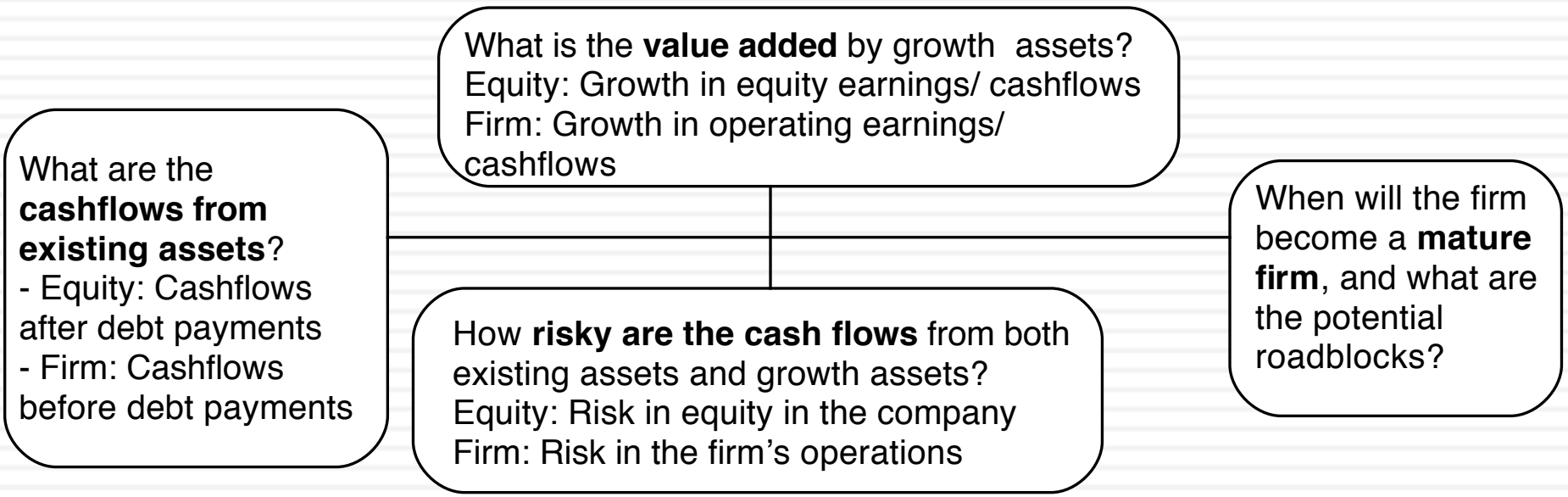
- The value of a risky asset can be estimated by discounting the expected cash flows on the asset over its life at a risk-adjusted discount rate:

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

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

# The Key Questions in valuation…





# DCF as a tool for intrinsic valuation



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

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

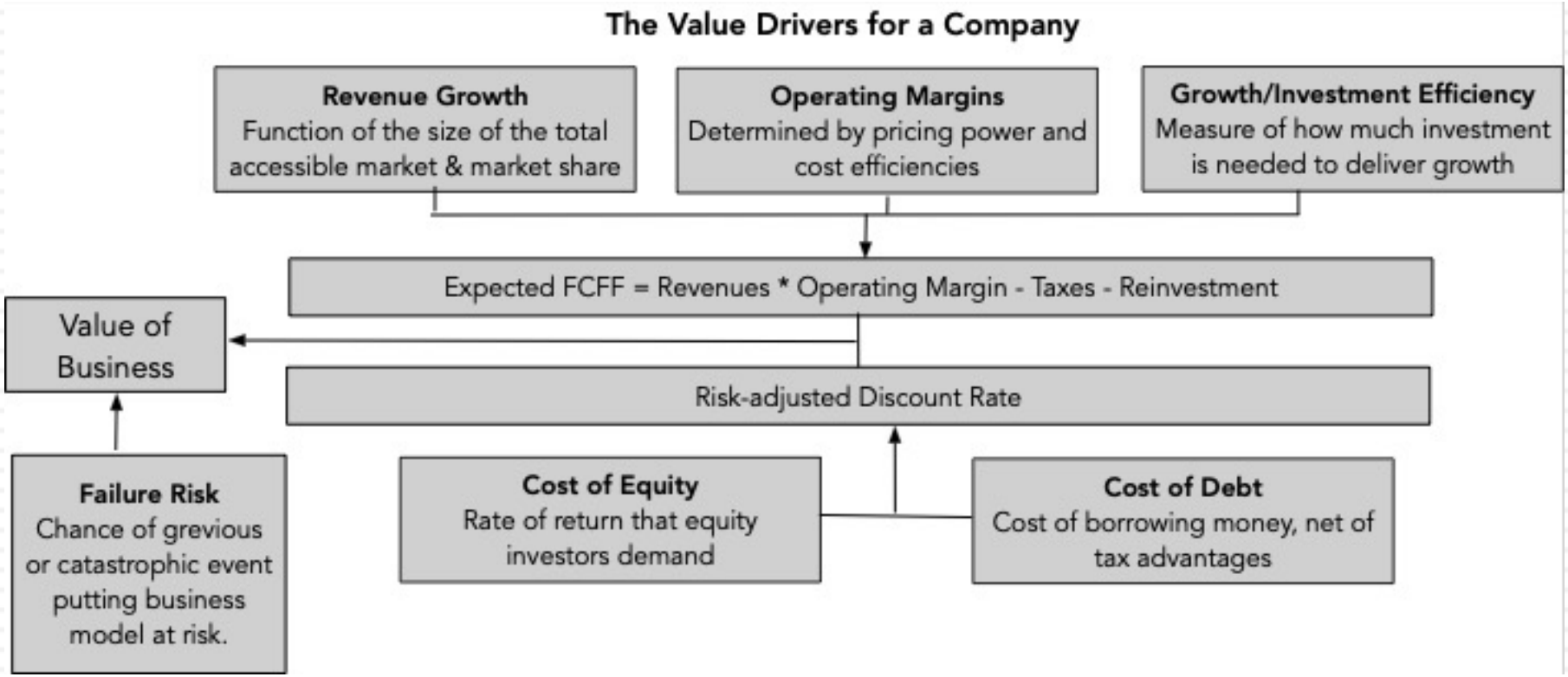
$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \ldots\ldots + \frac{E(CF_n)}{(1+r)^n}$$

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

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

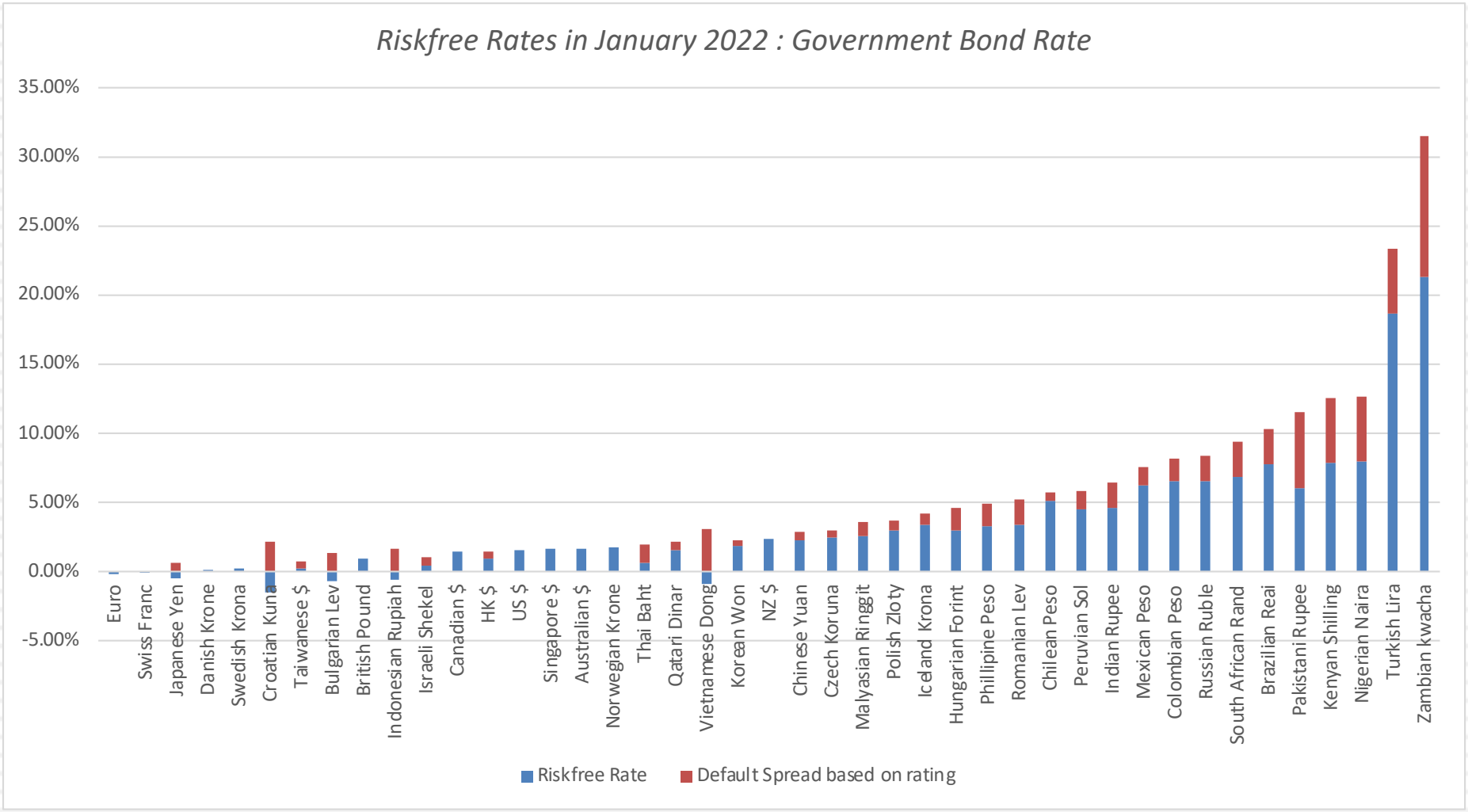
# And Business Drivers that determine value…





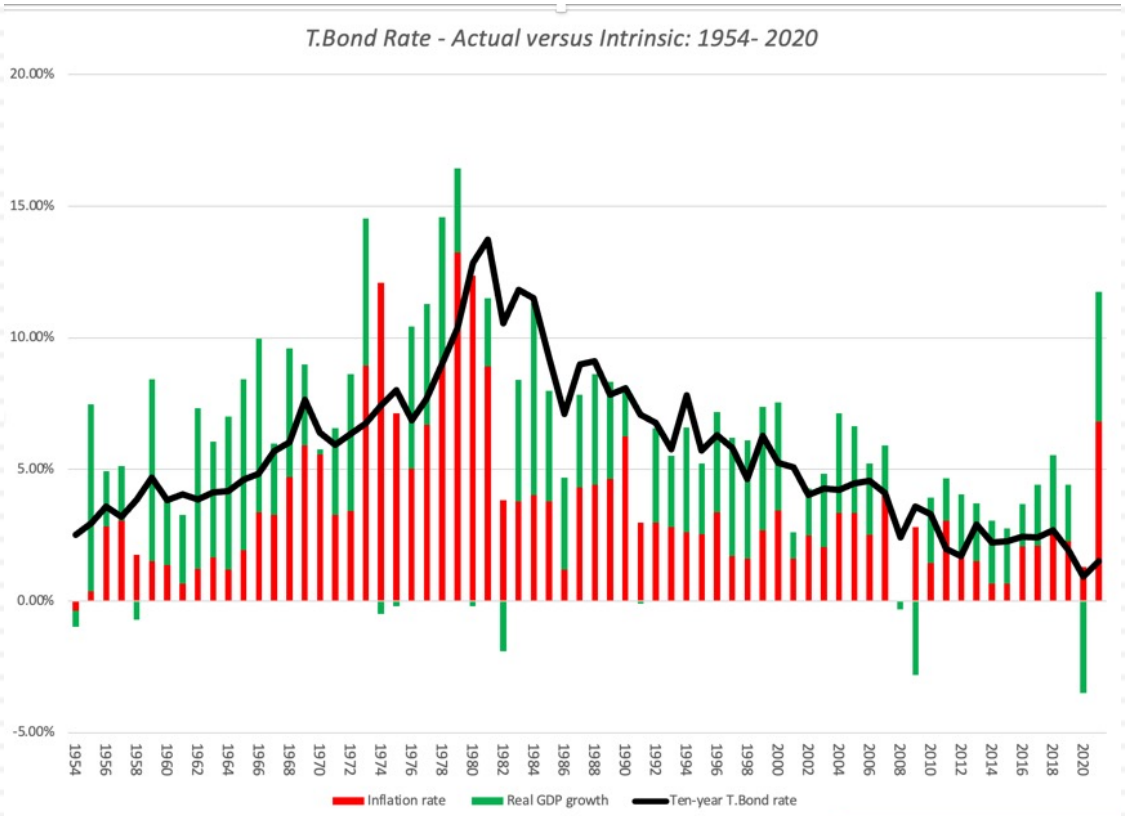
# 1. Match your cash flows to your discount rates..





# And the Fed is not the answer to every interest rate question..






| | Ten-year T.Bond rate | Inflation rate | Real GDP growth | Intrinsic riskfree rate |
|---|---|---|---|---|
| 1954-2021 | 5.59% | 3.55% | 2.94% | 6.50% |
| 1954-1980 | 5.83% | 4.49% | 3.50% | 7.98% |
| 1981-2008 | 6.88% | 3.26% | 3.04% | 6.30% |
| 2011-2021 | 2.25% | 1.76% | 1.70% | 3.46% |

# Currencies don't drive value… A Valuation of Infosys (an Indian company) in 2017



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

# Heineken: September 2019 (in Euros)

## Cash flows from existing assets

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

## The Payoff from growth

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

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

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

## Maturty and Closure

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

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

Euro Cashflows

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

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

## The Risk in the Cash flows

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

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

Cost of Equity 7.66%

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

Weights E = 59.9% D = 40.1%

Riskfree Rate: Euro Risk free rate = -0.50%

\+

Beta = 1.20

X

Firm's D/E Ratio: 66.98%

Unlevered beta of alcoholic beverage business = 0.80

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

*Arcelik's revenue growth has been solid and its margins have been high, but return on capital has been less that the cost of capital*

| | LTM | 2014-2019 | Industry Average |
|---|---|---|---|
| Revenue Growth | 37.03% | 20.14% | 7.83% |
| Pre-tax Operating Margin | 7.82% | 7.70% | 7.93% |
| ROIC | 11.70% | 12.74% | 18.68% |
| Sales/Capital | 1.70 | 1.77 | 2.73 |

# *Arcelik: My valuation (October 2019)*

Between 2014 and 2019, Arcelik reported a growth rate of 20.14% in revenues, an average operating margin of 7.70% and an average sales to capital ratio of 1.77.

**Stable Growth**
g = 10%
Cost of capital = 15%
ROC= 15%;
Reinvestment Rate= 10%/15% = 66.67%

Revenue growth of 20% a year for 5 years, tapering down to 10% in year 10

Pre-tax operating margin increases to 8.00% over time.

Sales to capital ratio of 2.73, matching global average

Terminal Value= 3,332/(.15-.10) = TL 66,633

| | |
|---|---|
| PV(Terminal value) | $11,766.68 |
| PV (CF over next 10 years) | $ 3,603.22 |
| Value of operating assets = | $15,369.90 |
| - Debt | $14,305.92 |
| - Minority interests | $ 114.60 |
| + Cash | $ 6,026.00 |
| + Non-operating assets | $ 481.10 |
| Value of equity | $ 7,456.48 |
| Number of shares | 675.70 |
| Estimated value /share | $ 11.04 |

| | 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% | 18.00% | 16.00% | 14.00% | 12.00% | 10.00% | 10.00% |
| Revenues | 30,440 ₺ | 36,528 ₺ | 43,834 ₺ | 52,600 ₺ | 63,120 ₺ | 75,744 ₺ | 89,378 ₺ | 103,679 ₺ | 118,194 ₺ | 132,377 ₺ | 145,615 ₺ | 160,177 ₺ |
| EBIT (Operating) margin | 7.82% | 7.84% | 7.86% | 7.88% | 7.89% | 7.91% | 7.93% | 7.95% | 7.96% | 7.98% | 8.00% | 8.00% |
| EBIT (Operating income) | 2,381 ₺ | 2,864 ₺ | 3,444 ₺ | 4,143 ₺ | 4,982 ₺ | 5,992 ₺ | 7,087 ₺ | 8,239 ₺ | 9,413 ₺ | 10,567 ₺ | 11,649 ₺ | 12,814 ₺ |
| Tax rate | 14.80% | 14.80% | 14.80% | 14.80% | 14.80% | 14.80% | 16.24% | 17.68% | 19.12% | 20.56% | 22.00% | 22.00% |
| EBIT(1-t) | 2,029 ₺ | 2,440 ₺ | 2,935 ₺ | 3,529 ₺ | 4,245 ₺ | 5,105 ₺ | 5,936 ₺ | 6,782 ₺ | 7,614 ₺ | 8,394 ₺ | 9,086 ₺ | 9,995 ₺ |
| - Reinvestment | | 2,226 ₺ | 2,672 ₺ | 3,206 ₺ | 3,847 ₺ | 4,616 ₺ | 4,986 ₺ | 5,230 ₺ | 5,308 ₺ | 5,187 ₺ | 4,841 ₺ | 6,663 ₺ |
| FCFF | | 214 ₺ | 263 ₺ | 324 ₺ | 398 ₺ | 489 ₺ | 950 ₺ | 1,553 ₺ | 2,306 ₺ | 3,208 ₺ | 4,246 ₺ | 3,332 ₺ |

Cost of capital = 24.73% (.522) + 16.01% (.478) = 20.64%

Cost of capital decreases to 15% from years 6-10

**On October 14, 2019, the shares were trading at 18 TL/share.**

Cost of equity = 24.73%

**Cost of Debt** *Rated B*
(11.06%+4.06%+5.40%)(1-.25) = 16.01%

**Weights**
E = 52.2% D = 47.8%

**Riskfree Rate**:
Riskfree rate = 11.06%

+

**Beta**
1.69

x

**Risk Premium**
8.11%

D/E = 89.04%

| Business | Revenues | EV/Sales | Estimated Value | Unlevered Beta |
|---|---|---|---|---|
| Furn/Home Furnishings | $ 20,657 | 0.9785 | $ 20,213 | 0.97 |
| Electronics (Consumer & Office) | $ 2,807 | 0.5769 | $ 1,619 | 1.30 |
| Arcelik | $ 23,464 | | $ 21,833 | 0.99 |

| Region | Revenues | ERP | Weight |
|---|---|---|---|
| Europe | 13,272 ₺ | 6.68% | 49.37% |
| Turkey | 8,425 ₺ | 10.53% | 31.34% |
| Asia | 2,299 ₺ | 7.00% | 8.55% |
| Africa & Mid East | 1,926 ₺ | 9.08% | 7.16% |
| Rest of the World | 963 ₺ | 7.39% | 3.58% |
| Total | 26,885 ₺ | 8.11% | 100.00% |

# 2. Risk is not in the past..

| | Arithmetic Average | | Geometric Average | |
|---|---|---|---|---|
| | Stocks - T. Bills | Stocks - T. Bonds | Stocks - T. Bills | Stocks - T. Bonds |
| 1928-2021 | 8.49% | 6.71% | 6.69% | 5.13% |
| Std Error | 2.05% | 2.17% | | |
| 1972-2021 | 8.04% | 5.47% | 6.70% | 4.47% |
| Std Error | 2.44% | 2.76% | | |
| 2012-2021 | 16.47% | 14.39% | 15.89% | 14.00% |
| Std Error | 3.88% | 4.59% | | |

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

# But in the future..



In 2021, earnings recovered almost entirely from the 2020 collapse and dividends & buybacks surged as well.

**Base year cash flow (last 12 mths)**
Dividends (TTM): 59.20
+ Buybacks (TTM): 88.05
= Cash to investors (TTM): **147.24**

**Expected earnings/cashflow growth in next 5 years**
Analysts were on target in 2021, with estimated earnings of 206.38 for the year. They were projecting compunded annual growth rate of 6.47% a year for next five years.

**Modified Payout**
This computation assumes that the payout ratio stays constant over time. If you assume that it changes to a sustainable level (given stable growth & ROE), the implied ERP = 4.90%

Actual numbers | Forecasted numbers

| | 2019 | 2020 | *LTM* | *2021E* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| Expected Earnings | 157.18 | 139.76 | 190.34 | 206.38 | 219.74 | 233.96 | 249.11 | 265.23 | 282.40 |
| Cash payout as % of earnings | 146.31 | 118.66 | 77.36% | 77.36% | 77.36% | 77.36% | 77.36% | 77.36% | 77.36% |
| Dividends + Buybacks = | 93.08% | 84.90% | 147.24 | 159.65 | $169.99 | $180.99 | $192.71 | $205.18 | $218.46 |

Earnings and Cash flows grow @1.51% (set equal to risk free rate) a year forever.

S&P 500 on 1/1/22= **4766.18**

$$4766.18 = \frac{169.99}{(1+r)} + \frac{180.99}{(1+r)^2} + \frac{192.71}{(1+r)^3} + \frac{205.18}{(1+r)^4} + \frac{218.46}{(1+r)^5} + \frac{218.46\,(1.0151)}{(r-.0151)(1+r)^5}$$

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

**Solve for r**

You can solve for this r either iteratively or using the solver function in Excel

r = Implied Expected Return on Stocks = 5.75%

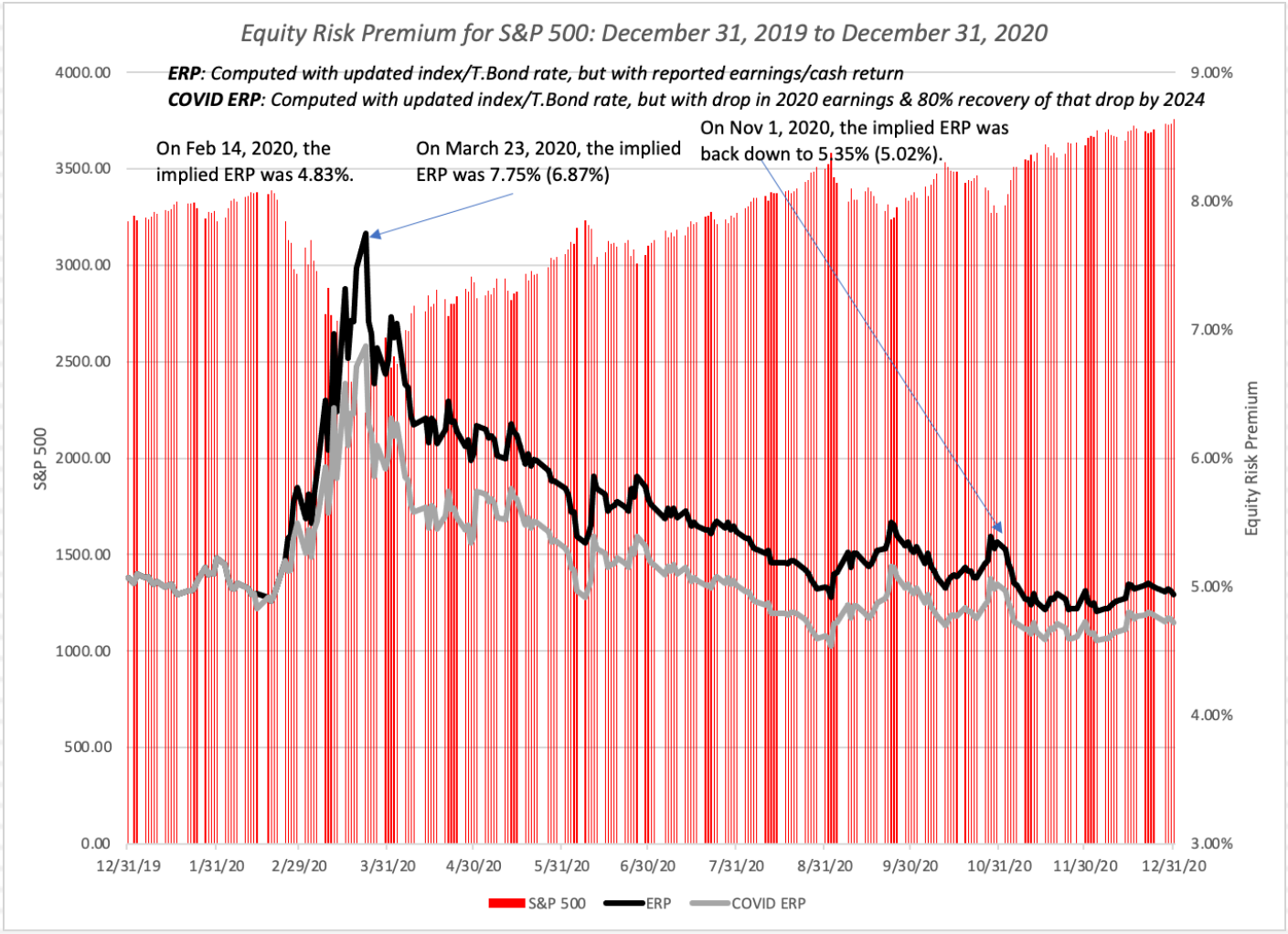
*Minus*

Risk free rate = T.Bond rate on 1/1/22= 1.51%

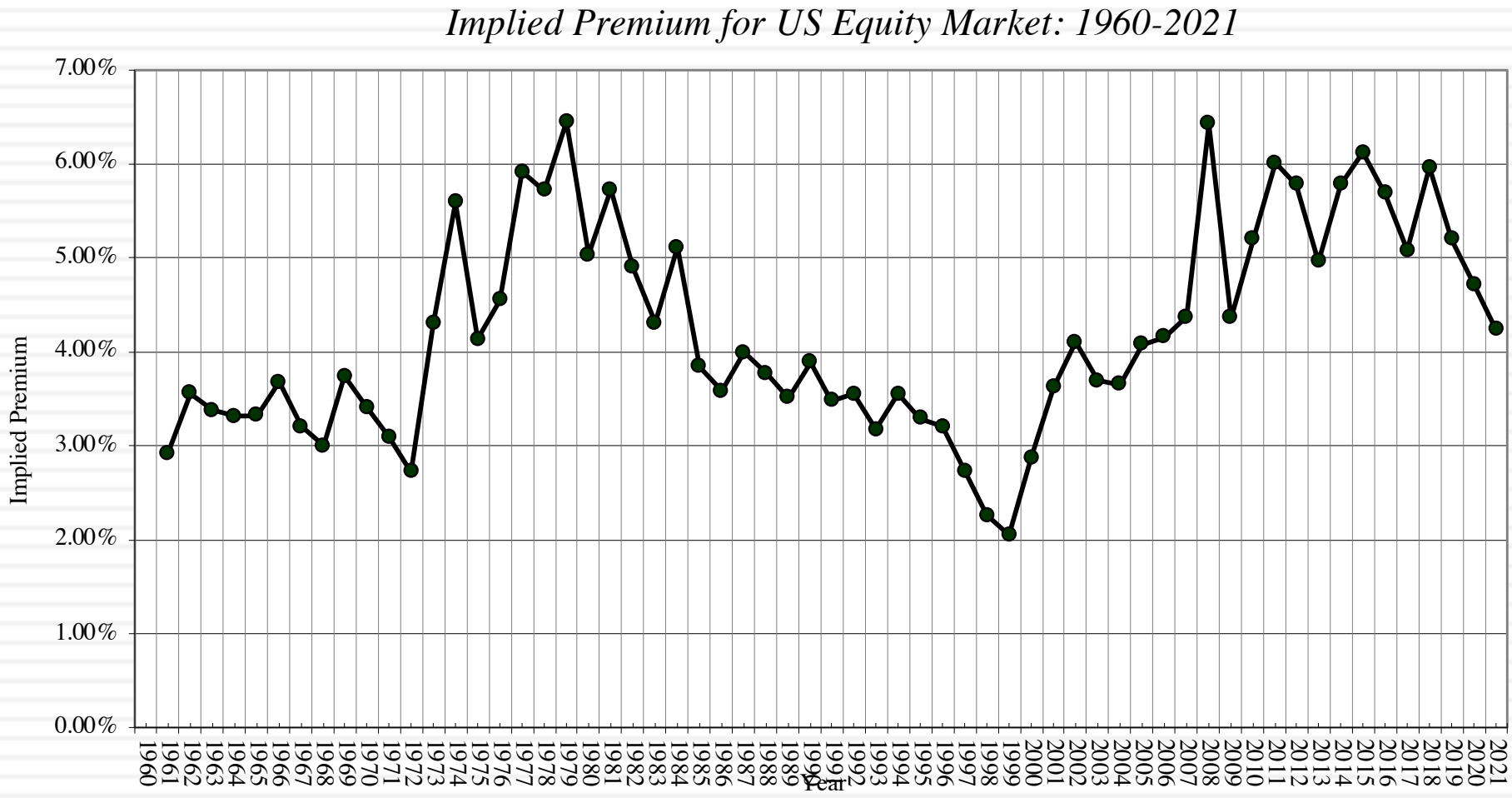
*Equals*

Implied Equity Risk Premium (1/1/22) = 5.75% - 1.51% = 4.24%

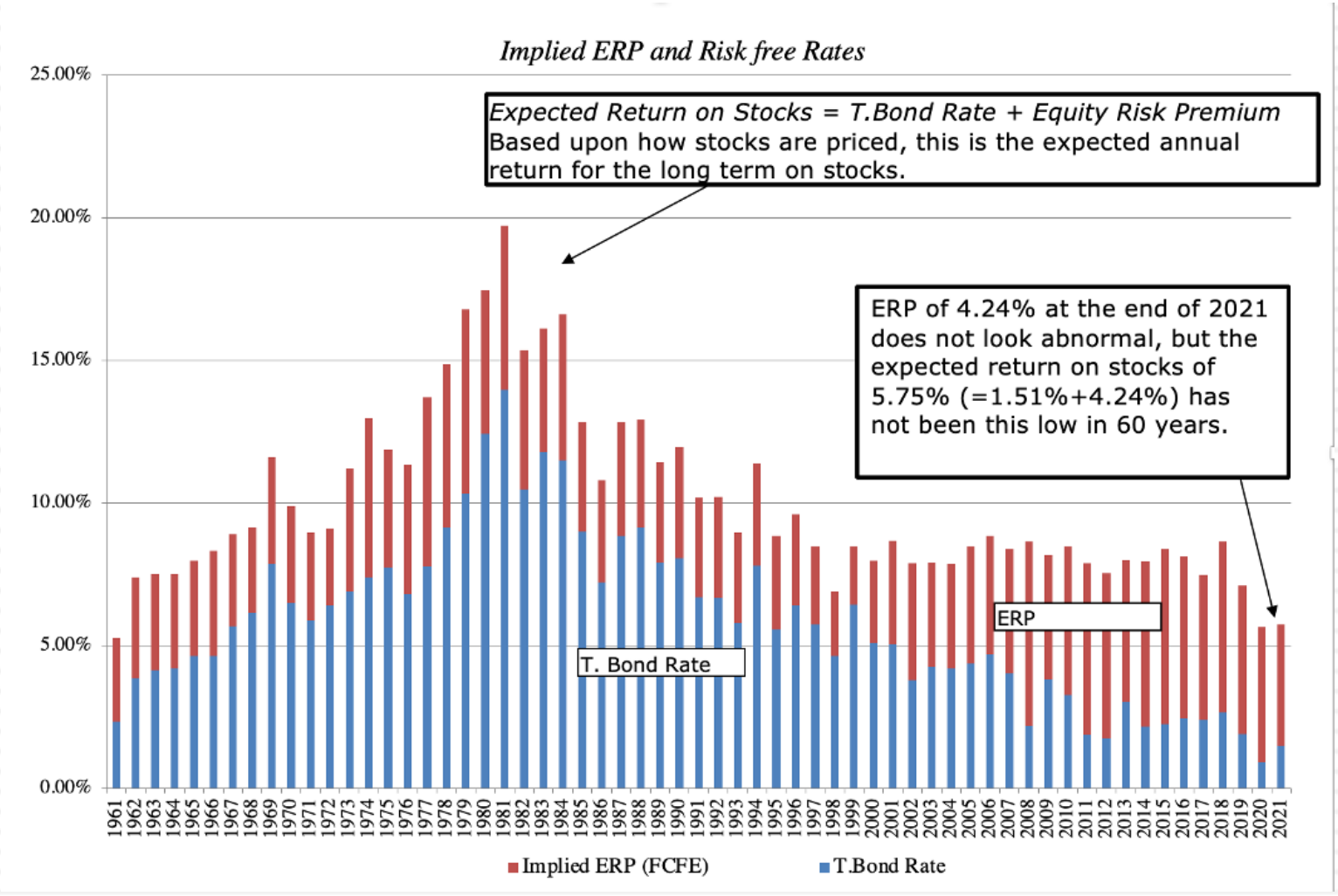
# The Price of Risk: The COVID crisis



# Comparison to History

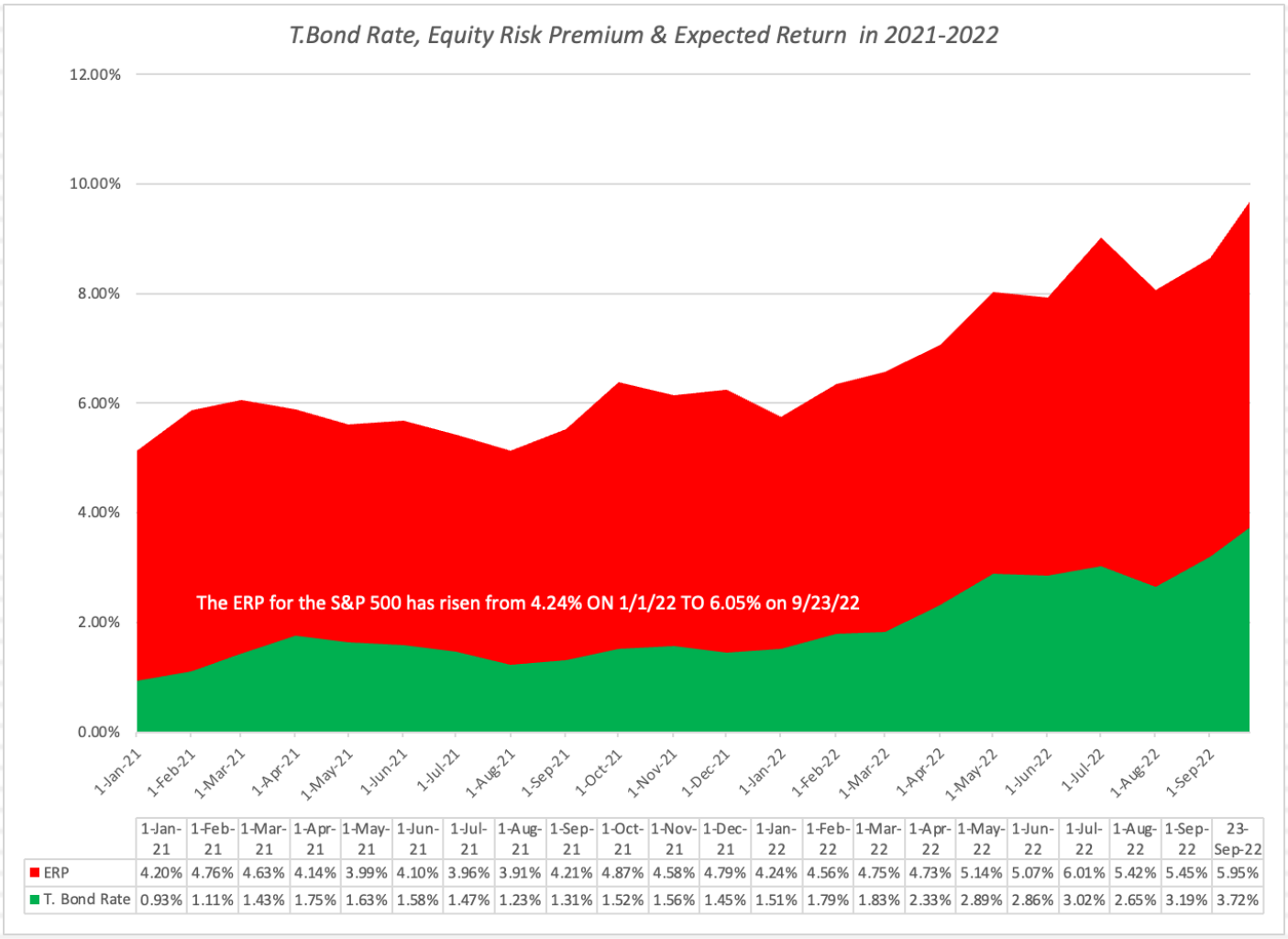


# But there is a catch…



# Which may explain 2022…






| | 1-Jan-21 | 1-Feb-21 | 1-Mar-21 | 1-Apr-21 | 1-May-21 | 1-Jun-21 | 1-Jul-21 | 1-Aug-21 | 1-Sep-21 | 1-Oct-21 | 1-Nov-21 | 1-Dec-21 | 1-Jan-22 | 1-Feb-22 | 1-Mar-22 | 1-Apr-22 | 1-May-22 | 1-Jun-22 | 1-Jul-22 | 1-Aug-22 | 1-Sep-22 | 23-Sep-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ERP | 4.20% | 4.76% | 4.63% | 4.14% | 3.99% | 4.10% | 3.96% | 3.91% | 4.21% | 4.87% | 4.58% | 4.79% | 4.24% | 4.56% | 4.75% | 4.73% | 5.14% | 5.07% | 6.01% | 5.42% | 5.45% | 5.95% |
| T. Bond Rate | 0.93% | 1.11% | 1.43% | 1.75% | 1.63% | 1.58% | 1.47% | 1.23% | 1.31% | 1.52% | 1.56% | 1.45% | 1.51% | 1.79% | 1.83% | 2.33% | 2.89% | 2.86% | 3.02% | 2.65% | 3.19% | 3.72% |

# 3. Globalization is not a buzz word



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

# ERP : July 2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Andorra (Principality of) | Baa2 | 2.28% | 8.67% | Italy | Baa3 | 2.64% | 9.08% |
| Austria | Aa1 | 0.48% | 6.57% | Jersey (States of) | Aaa | 0.00% | 6.01% |
| Belgium | Aa3 | 0.72% | 6.85% | Liechtenstein | Aaa | 0.00% | 6.01% |
| Cyprus | Ba1 | 3.00% | 9.51% | Luxembourg | Aaa | 0.00% | 6.01% |
| Denmark | Aaa | 0.00% | 6.01% | Malta | A2 | 1.02% | 7.19% |
| Finland | Aa1 | 0.48% | 6.57% | Netherlands | Aaa | 0.00% | 6.01% |
| France | Aa2 | 0.59% | 6.70% | Norway | Aaa | 0.00% | 6.01% |
| Germany | Aaa | 0.00% | 6.01% | Portugal | Baa2 | 2.28% | 8.67% |
| Greece | Ba3 | 4.31% | 11.04% | Spain | Ba1 | 1.92% | 8.24% |
| Guernsey (States of) | Aaa | 0.00% | 6.01% | Sweden | Aaa | 0.00% | 6.01% |
| Iceland | A2 | 1.02% | 7.19% | Switzerland | Aaa | 0.00% | 6.01% |
| Ireland | A1 | 0.85% | 7.00% | Turkey | B2 | 6.60% | 13.70% |
| Isle of Man | Aa3 | 0.72% | 6.85% | United Kingdom | Aa3 | 0.72% | 6.85% |
| | | | | **Western Europe** | | **1.16%** | **7.17%** |

| | | | |
|---|---|---|---|
| Canada | Aaa | 0.00% | 6.01% |
| United States | Aaa | 0.00% | 6.01% |
| **US & Canada** | | **0.00%** | **6.01%** |

| | | | |
|---|---|---|---|
| **Caribbean** | | **9.06%** | **15.07%** |

| | | | |
|---|---|---|---|
| Argentina | Ca | 14.39% | 22.79% |
| Belize | Caa3 | 12.00% | 19.99% |
| Bolivia | B2 | 6.60% | 13.70% |
| Brazil | Ba2 | 3.61% | 10.22% |
| Chile | A1 | 0.85% | 7.00% |
| Colombia | Baa2 | 2.28% | 8.67% |
| Costa Rica | B2 | 6.60% | 13.70% |
| Ecuador | Caa3 | 12.00% | 19.99% |
| El Salvador | Caa3 | 12.00% | 19.99% |
| Guatemala | Ba1 | 3.00% | 9.51% |
| Honduras | B1 | 5.40% | 12.30% |
| Mexico | Baa1 | 1.92% | 8.24% |
| Nicaragua | B3 | 7.80% | 15.10% |
| Panama | Baa2 | 2.28% | 8.67% |
| Paraguay | Ba1 | 3.00% | 9.51% |
| Peru | Baa1 | 1.92% | 8.24% |
| Suriname | Caa3 | 12.00% | 19.99% |
| Uruguay | Baa2 | 2.28% | 8.67% |
| Venezuela | C | 17.50% | 26.41% |
| **Latin America** | | **5.20%** | **11.21%** |

| *Country* | *Rating* | *CRP* | *ERP* |
|---|---|---|---|
| Angola | B3 | 7.80% | 15.10% |
| Benin | B1 | 5.40% | 12.30% |
| Botswana | A3 | 1.44% | 7.69% |
| Burkina Faso | Caa1 | 8.99% | 16.49% |
| Cameroon | B2 | 6.60% | 13.70% |
| Cape Verde | B3 | 7.80% | 15.10% |
| Congo (Democratic Republic of) | Caa1 | 8.99% | 16.49% |
| Congo (Republic of) | Caa2 | 10.80% | 18.60% |
| Côte d'Ivoire | Ba3 | 4.31% | 11.04% |
| Egypt | B2 | 6.60% | 13.70% |
| Ethiopia | Caa2 | 10.80% | 18.60% |
| Gabon | Caa1 | 8.99% | 16.49% |
| Ghana | Caa1 | 8.99% | 16.49% |
| Kenya | B2 | 6.60% | 13.70% |
| Mali | Caa2 | 10.80% | 18.60% |
| Mauritius | Baa2 | 2.28% | 8.67% |
| Morocco | Ba1 | 3.00% | 9.51% |
| Mozambique | Caa2 | 10.80% | 18.60% |
| Namibia | B1 | 5.40% | 12.30% |
| Niger | B3 | 7.80% | 15.10% |
| Nigeria | B2 | 6.60% | 13.70% |
| Rwanda | B2 | 6.60% | 13.70% |
| Senegal | Ba3 | 4.31% | 11.04% |
| South Africa | Ba2 | 3.61% | 10.22% |
| Swaziland | B3 | 7.80% | 15.10% |
| Tanzania | B2 | 6.60% | 13.70% |
| Togo | B3 | 7.80% | 15.10% |
| Tunisia | Caa1 | 8.99% | 16.49% |
| Uganda | B2 | 6.60% | 13.70% |
| Zambia | Ca | 14.39% | 22.79% |
| **Africa** | | **7.36%** | **13.37%** |

| | | | |
|---|---|---|---|
| Albania | B1 | 5.40% | 12.30% |
| Armenia | Ba3 | 4.31% | 11.04% |
| Azerbaijan | Ba2 | 3.61% | 10.22% |
| Belarus | Ca | 14.39% | 22.79% |
| Bosnia and Herzegovina | B3 | 7.80% | 15.10% |
| Bulgaria | Baa1 | 1.92% | 8.24% |
| Croatia | Ba1 | 3.00% | 9.51% |
| Czech Republic | Aa3 | 0.72% | 6.85% |
| Estonia | A1 | 0.85% | 7.00% |
| Georgia | Ba2 | 3.61% | 10.22% |
| Hungary | Baa2 | 2.28% | 8.67% |
| Kazakhstan | Baa2 | 2.28% | 8.67% |
| Kyrgyzstan | B3 | 7.80% | 15.10% |
| Latvia | A3 | 1.44% | 7.69% |
| Lithuania | A2 | 1.02% | 7.19% |
| Macedonia | Ba3 | 4.31% | 11.04% |
| Moldova | B3 | 7.80% | 15.10% |
| Montenegro | B1 | 5.40% | 12.30% |
| Poland | A2 | 1.02% | 7.19% |
| Romania | Baa3 | 2.64% | 9.08% |
| Russia | Ca | 14.39% | 22.79% |
| Serbia | Ba2 | 3.61% | 10.22% |
| Slovakia | A2 | 1.02% | 7.19% |
| Slovenia | A3 | 1.44% | 7.69% |
| Tajikistan | B3 | 7.80% | 15.10% |
| Ukraine | Caa3 | 12.00% | 19.99% |
| Uzbekistan | B1 | 5.40% | 12.30% |
| **E. Europe & Russia** | | **8.85%** | **14.86%** |

| | | | |
|---|---|---|---|
| Abu Dhabi | Aa2 | 0.59% | 6.70% |
| Bahrain | B2 | 6.60% | 13.70% |
| Iraq | Caa1 | 8.99% | 16.49% |
| Israel | A1 | 0.85% | 7.00% |
| Jordan | B1 | 5.40% | 12.30% |
| Kuwait | A1 | 0.85% | 7.00% |
| Lebanon | C | 17.50% | 26.41% |
| Oman | Ba3 | 4.31% | 11.04% |
| Qatar | Aa3 | 0.72% | 6.85% |
| Ras Al Khaimah (Emirate of) | A1 | 0.85% | 7.00% |
| Saudi Arabia | A1 | 0.85% | 7.00% |
| Sharjah | Baa3 | 2.64% | 9.08% |
| United Arab Emirates | Aa2 | 0.59% | 6.70% |
| **Middle East** | | **2.02%** | **8.03%** |

| *Country* | *PRS* | *CRP* | *ERP* |
|---|---|---|---|
| Algeria | 66.75 | 6.29% | 12.30% |
| Brunei | 79.25 | 1.18% | 7.19% |
| Gambia | 66.25 | 6.29% | 12.30% |
| Guinea | 58 | 12.59% | 18.60% |
| Guinea-Bissau | 63.5 | 9.09% | 15.10% |
| Guyana | 75.75 | 2.23% | 8.24% |
| Haiti | 56 | 13.98% | 19.99% |
| Iran | 66.25 | 6.29% | 12.30% |
| Korea, D.P.R. | 51.25 | 16.78% | 22.79% |
| Liberia | 58.25 | 12.59% | 18.60% |
| Libya | 71 | 4.21% | 10.22% |
| Madagascar | 63.25 | 9.09% | 15.10% |
| Malawi | 56.75 | 13.98% | 19.99% |
| Myanmar | 57.75 | 12.59% | 18.60% |
| Sierra Leone | 54.75 | 16.78% | 22.79% |
| Somalia | 52 | 16.78% | 22.79% |
| Sudan | 47 | 20.40% | 26.41% |
| Syria | 45.25 | 20.40% | 26.41% |
| Yemen, Republic | 48.25 | 20.40% | 26.41% |
| Zimbabwe | 60.75 | 10.48% | 16.49% |

| | | | |
|---|---|---|---|
| Bangladesh | Ba3 | 4.31% | 11.04% |
| Cambodia | B2 | 6.60% | 13.70% |
| China | A1 | 0.85% | 7.00% |
| Fiji | B1 | 5.40% | 12.30% |
| Hong Kong | Aa3 | 0.72% | 6.85% |
| India | Baa3 | 2.64% | 9.08% |
| Indonesia | Baa2 | 2.28% | 8.67% |
| Japan | A1 | 0.85% | 7.00% |
| Korea | Aa2 | 0.59% | 6.70% |
| Laos | Caa3 | 12.00% | 19.99% |
| Macao | Aa3 | 0.72% | 6.85% |
| Malaysia | A3 | 1.44% | 7.69% |
| Maldives | Caa1 | 8.99% | 16.49% |
| Mongolia | B3 | 7.80% | 15.10% |
| Pakistan | B3 | 7.80% | 15.10% |
| Papua New Guinea | B2 | 6.60% | 13.70% |
| Philippines | Baa2 | 2.28% | 8.67% |
| Singapore | Aaa | 0.00% | 6.01% |
| Solomon Islands | Caa1 | 8.99% | 16.49% |
| Sri Lanka | Ca | 14.39% | 22.79% |
| Taiwan | Aa3 | 0.72% | 6.85% |
| Thailand | Baa1 | 1.92% | 8.24% |
| Vietnam | Ba3 | 4.31% | 11.04% |
| **Asia** | | **1.56%** | **7.57%** |

| | | | |
|---|---|---|---|
| Australia | Aaa | 0.00% | 6.01% |
| Cook Islands | Caa1 | 8.99% | 16.49% |
| New Zealand | Aaa | 0.00% | 6.01% |
| **Australia & NZ** | | **0.00%** | **6.01%** |

Aswath Damodaran

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

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

*Fertiglobe Revenue Breakdown in 2022*

| Region | Revenues | ERP | Weight |
|---|---|---|---|
| Africa | $294 | 13.37% | 8.88% |
| Asia & Oceania | $1,177 | 7.57% | 35.55% |
| Central and South America | $476 | 11.21% | 14.38% |
| Middle East | $61 | 8.03% | 1.84% |
| North America | $356 | 6.01% | 10.75% |
| Western Europe | $947 | 7.17% | 28.60% |
| Total | $3,311 | 8.33% | 100.00% |

1. By focusing on revenues, are we misestimating country risk exposure?
2. As the company looks to grow more in some parts of the world than others, how with the risk premium change?

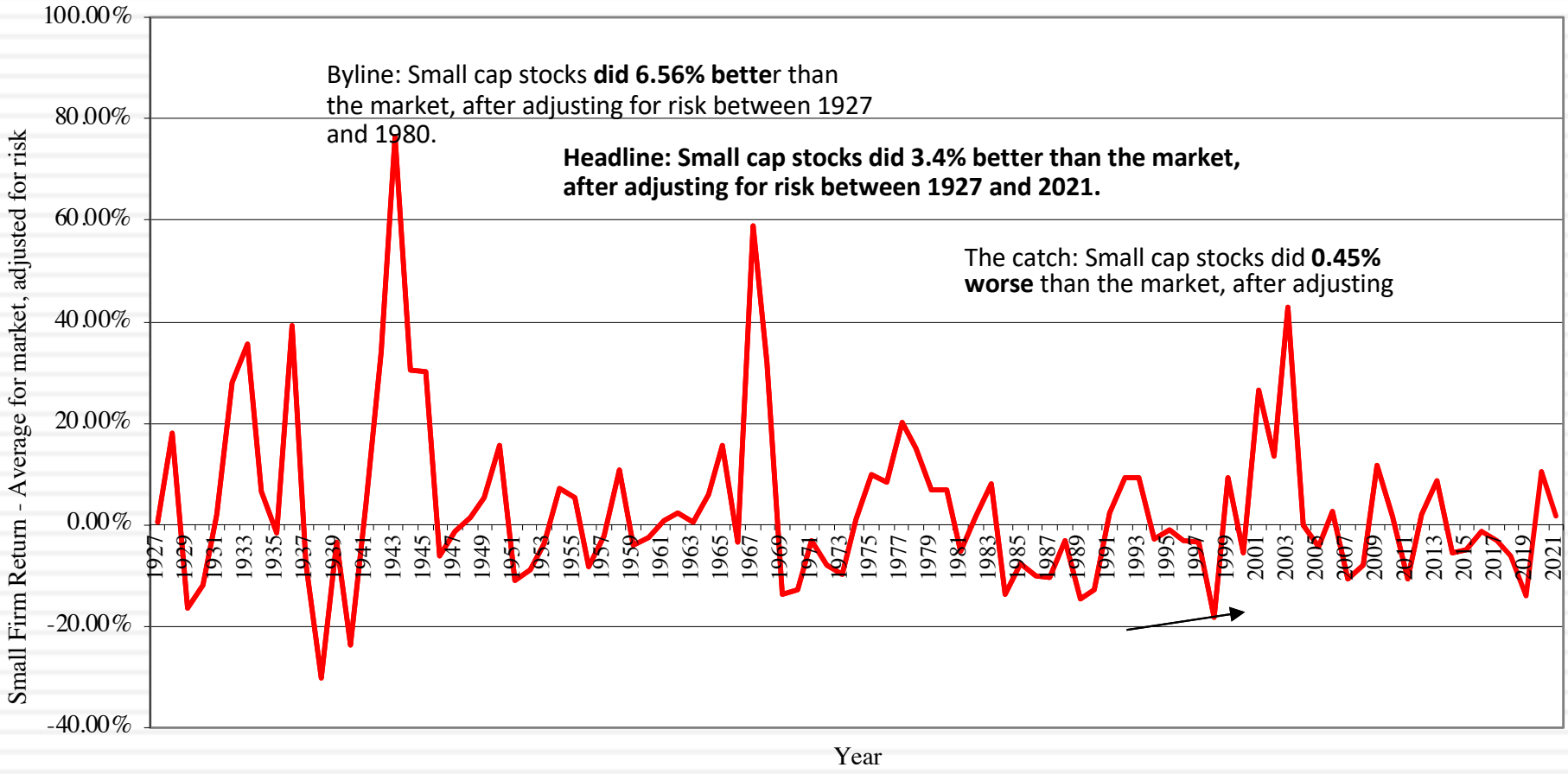
# Shell: Equity Risk Premium- March 2016

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

# 4. Everyone may do it, but that does not make it right.. The small cap premium

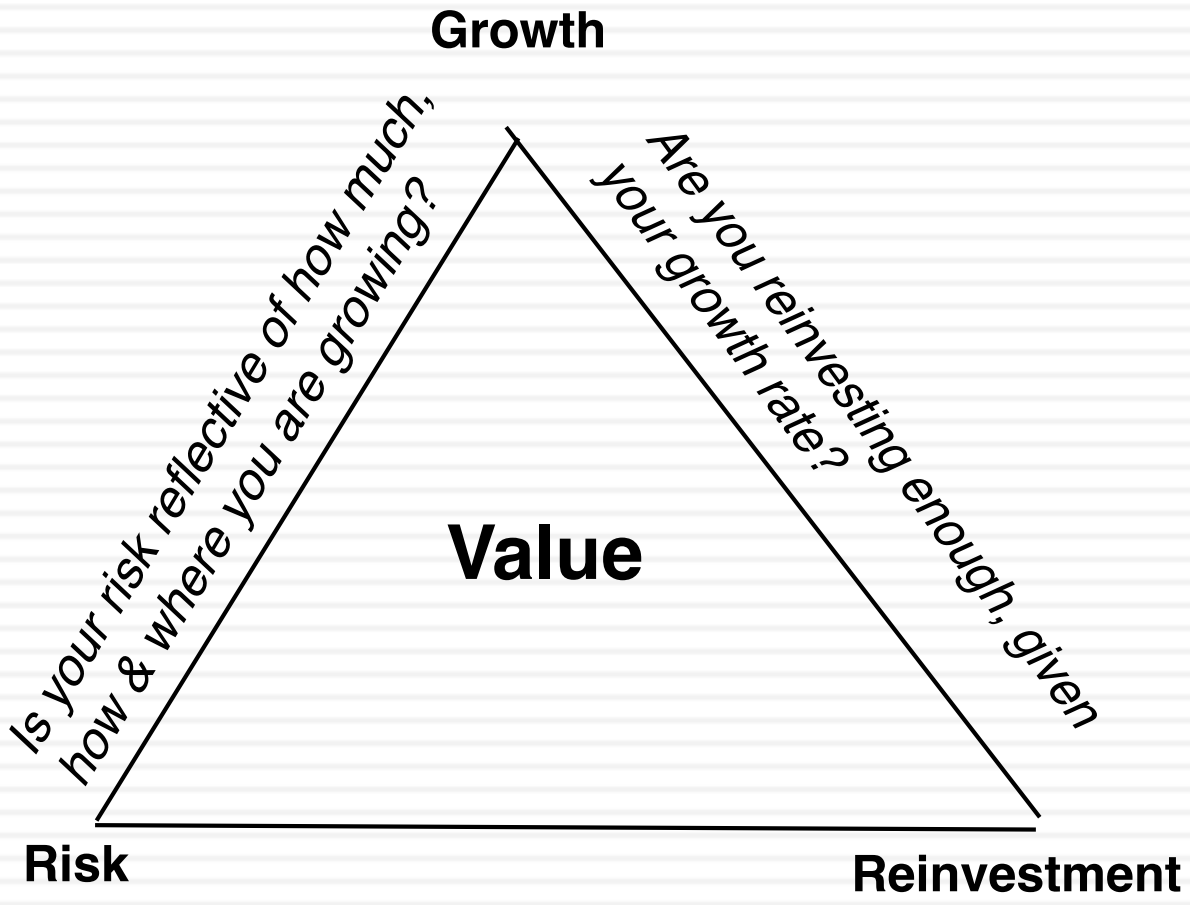


*Small Firm Premium over time- 1927 -2021*



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






*Is your risk consistent with your reinvestment strategy?*

# The Improbable: Willy Wonkitis

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

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

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

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

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

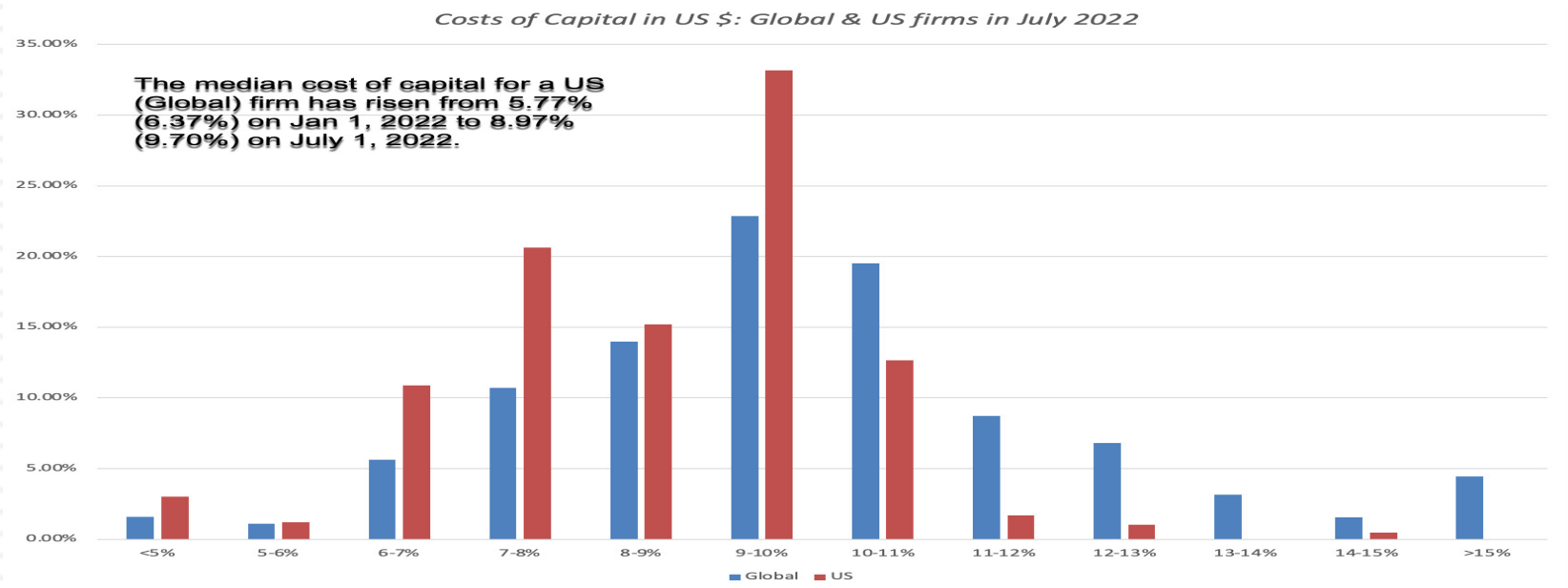
# And consider the trade offs in 2021..




| Sub Group | Number of firms | Return on Capital - Cost of Capital | | | | | Positive | Negative |
|---|---|---|---|---|---|---|---|---|
| | | <-5% | -5% to -2% | -2% to +2% | 2% to 5% | >5% | | |
| Africa and Middle East | 1,913 | 37.95% | 14.69% | 14.22% | 7.16% | 25.98% | 39.52% | 60.48% |
| Australia & NZ | 1,510 | 60.66% | 5.23% | 7.48% | 4.37% | 22.25% | 30.66% | 69.34% |
| Canada | 2,071 | 72.33% | 4.01% | 6.13% | 2.95% | 14.58% | 21.05% | 78.95% |
| China | 6,377 | 27.16% | 14.08% | 13.88% | 8.95% | 35.93% | 51.73% | 48.27% |
| Eastern Europe & Russia | 415 | 30.60% | 12.77% | 16.14% | 9.88% | 30.60% | 47.95% | 52.05% |
| EU & Environs | 4,698 | 34.36% | 11.56% | 12.71% | 6.85% | 34.53% | 47.40% | 52.60% |
| India | 3,526 | 33.35% | 17.81% | 12.62% | 7.71% | 28.50% | 41.97% | 58.03% |
| Japan | 3,665 | 17.49% | 16.13% | 22.05% | 10.89% | 33.45% | 53.70% | 46.30% |
| Latin America & Caribbean | 847 | 31.17% | 11.57% | 13.70% | 8.50% | 35.06% | 49.23% | 50.77% |
| Small Asia | 8,346 | 35.85% | 15.96% | 15.37% | 8.24% | 24.57% | 39.91% | 60.09% |
| UK | 1,037 | 37.51% | 9.35% | 10.22% | 5.01% | 37.90% | 48.60% | 51.40% |
| United States | 4,593 | 39.95% | 16.20% | 6.88% | 5.60% | 31.37% | 40.15% | 59.85% |
| Global | 38,998 | 35.67% | 13.92% | 13.17% | 7.53% | 29.71% | 43.40% | 56.60% |

# 6. Don’t sweat the small stuff






| Sub Group | # firms | 1st Decile | !st Quartile | Median | 3rd Quartile | 9th Decile |
|---|---|---|---|---|---|---|
| Africa and Middle East | 2,356 | 7.30% | 8.61% | 10.60% | 13.12% | 16.42% |
| Australia & NZ | 1,878 | 7.08% | 8.26% | 9.09% | 9.27% | 10.21% |
| Canada | 2,937 | 7.34% | 8.78% | 9.07% | 9.23% | 10.21% |
| China | 7,043 | 7.32% | 8.83% | 10.09% | 10.73% | 12.00% |
| EU & Environs | 6,000 | 6.99% | 8.31% | 9.61% | 10.94% | 13.39% |
| Eastern Europe & Russia | 528 | 8.07% | 9.55% | 12.13% | 20.32% | 28.61% |
| India | 3,982 | 7.32% | 9.55% | 11.19% | 12.43% | 13.18% |
| Japan | 3,947 | 6.99% | 8.44% | 9.83% | 10.63% | 11.52% |
| Latin America & Caribbean | 1,043 | 7.86% | 9.09% | 10.99% | 13.83% | 18.27% |
| Small Asia | 9,408 | 7.81% | 9.20% | 10.37% | 12.04% | 14.68% |
| UK | 1,255 | 7.51% | 8.25% | 9.95% | 10.61% | 11.30% |
| United States | 7,229 | 6.76% | 7.34% | 8.97% | 9.62% | 10.24% |
| Global | 47,606 | 7.20% | 8.58% | 9.70% | 10.98% | 12.84% |

# 7. Don't let your terminal value run away with your valuation

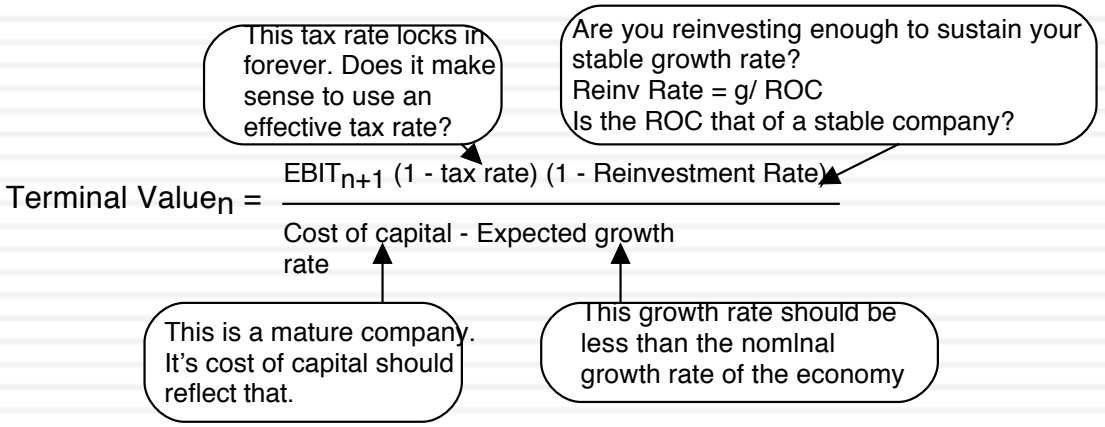


- In the terminal value equation, the growth seems to be the magic input, the key driver of value.

$$Terminal\ Value_n = \frac{Free\ Cash\ Flow_{n+1}}{(r-g)}$$

- Since that growth rate has to be maintained in perpetuity, it cannot exceed the growth rate of the economy in which you operate:
  - If your valuation is in nominal terms, it is the nominal growth rate of the economy. If it is is real terms, it is the real growth rate.
  - If your company is purely domestic, it is the growth rate of the domestic economy. If it is global, it is the global economy.

# All good things come to an end..And the terminal value is not an ATM…




| Myth 5.1: The only way to estimate terminal value is to use the perpetual growth model. | Myth 5.2: The perpetual growth model can give you an infinite value. | Myth 5.3: The growth rate is your biggest driver of terminal value. | Myth 5.4: Your growth rate cannot be negtive in a perpetual growth model. | Myth 5.5: If your terminal value is a high proportion of your DCF value, it is flawed. |
|---|---|---|---|---|

$$\text{Value of an asset with life} > n \text{ years} = \frac{E(CF_1)}{(1+r)^1} + \frac{E(CF_2)}{(1+r)^2} + .. + \frac{E(CF_n)}{(1+r)^n} + \frac{\text{Terminal Value}_n}{(1+r)^n}$$

| Truth 5.1: The terminal value can be based on annuities or a liquidation value. | Truth 5.2: Not if growth forever is capped at the growth rate of the economy. | Truth 5.3: Growth is not free & increasing growth can add or destory value. | Truth 5.4: Growth can be negative forever & is often more reflective of reality. | Truth 5.5: The terminal value should be a high percent of value today. |
|---|---|---|---|---|

# My Simple Proxy: The Risk free Rate

- I use a simpler and more easily observable number as **a cap** on stable growth: the risk free rate that I have used in the valuation. This takes into account the currency automatically (since higher inflation currencies have higher risk free rates) and it is not unreasonable to argue that it is a good proxy for the nominal growth rate in the economy.
- There are three reasons I do it:
  - The best predictor nominal growth in the US economy at the start of every decade has been the US treasury bond rate at the time.
  - It preserves consistency. If you believe, as many have, that the risk free rate is too low in US $ or Euros, it compensates for the resulting too-low cost of capital by also capping the growth rate at the same number (at least in terminal value).
  - It puts a control on my biases.

# A Consistent Version of Terminal Value

- The terminal value equation can be restated:

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

**Terminal Value for a firm with $100 million in after-tax operating income & cost of capital = 10% (for different g and ROIC)**

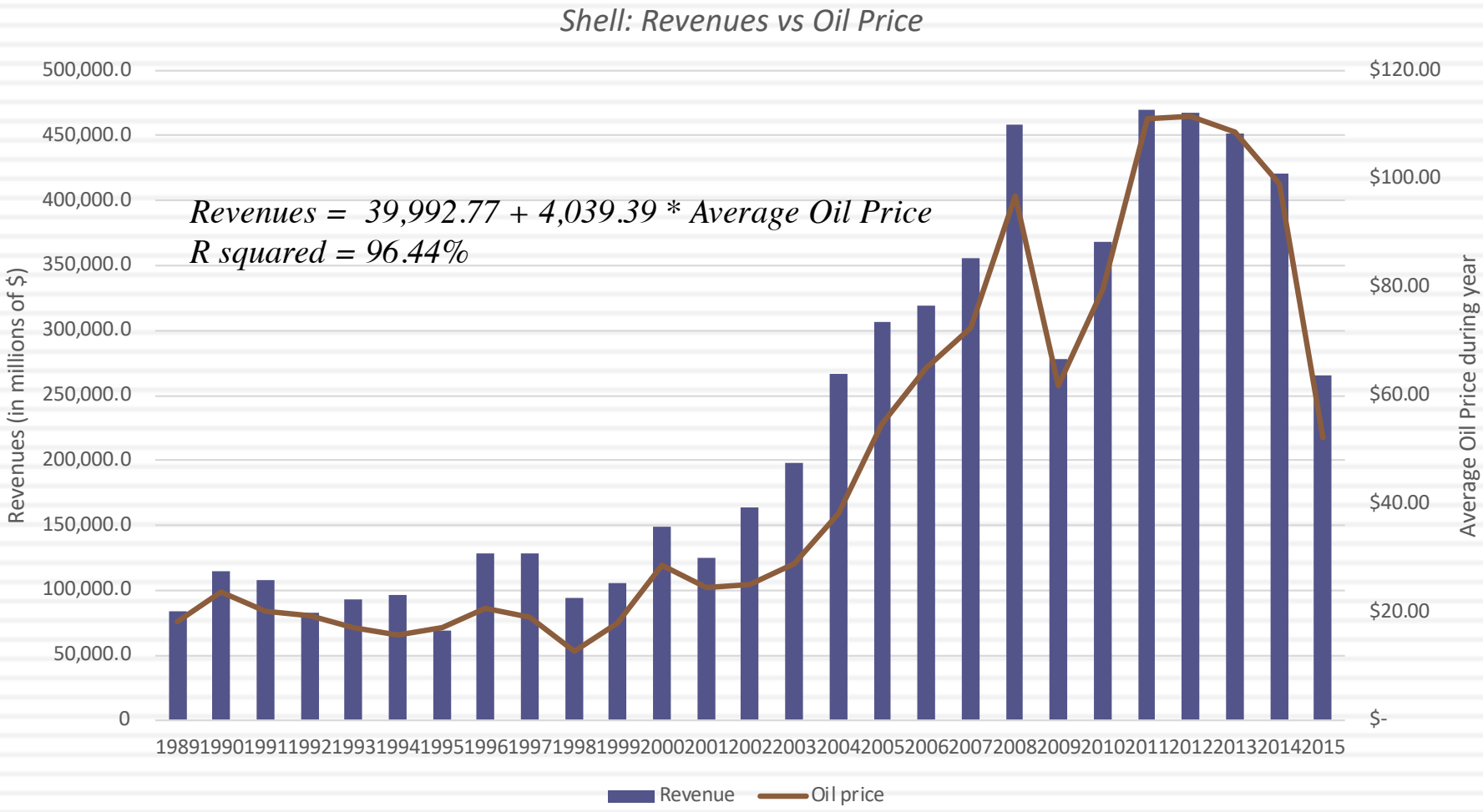
| | | *Return on capital in perpetuity* | | | | |
|---|---|---|---|---|---|---|
| | | 6% | 8% | 10% | 12% | 14% |
| *Growth rate forever* | 0.00% | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 |
| | 0.50% | $965 | $987 | $1,000 | $1,009 | $1,015 |
| | 1.00% | $926 | $972 | $1,000 | $1,019 | $1,032 |
| | 1.50% | $882 | $956 | $1,000 | $1,029 | $1,050 |
| | 2.00% | $833 | $938 | $1,000 | $1,042 | $1,071 |
| | 2.50% | $778 | $917 | $1,000 | $1,056 | $1,095 |
| | 3.00% | $714 | $893 | $1,000 | $1,071 | $1,122 |

# 8. Don’t let your macro views drown out your micro views..



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

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



# Valuing Shell at April 2016 oil price ($40)

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

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

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

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

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

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

# Fertiglobe: My valuation (October 2022)

*Fertiglobe comes into this valuation growing much faster than the typical fertilizer company and will much higher margins.*

| | Fertiglobe | All Fertilizer | Fertilizer - Largest |
|---|---|---|---|
| Revenue growth | 102.10% | 16.00% | 21.70% |
| Operating margin | 46.14% | 11.83% | 22.42% |
| Sales to Capital | 1.79 | 1.47 | 1.75 |

Revenue growth of 50 next year, followed by 15% a year for next 4 years, tapering down to 4% forever.

Between 2018 and 2022 Fertiglobe has almost quadrupled revenue, and in the LTM, the company earned an operating margin of 46.14% and had a sales to capital ratio of 1.79

Pre-tax operating margin decreases to 40.00% over time.

Sales to capital ratio of 1.79, matching company's current

**Stable Growth**
g = 4%
Cost of capital = 10.10%
ROC= 15%;
Reinvestment Rate= 4%/15% = 26.67%

Terminal Value= 4220/(.101-.04) = $ 70,220

| | Base year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Terminal year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue growth rate | | 50.00% | 15.00% | 15.00% | 15.00% | 15.00% | 12.80% | 10.60% | 8.40% | 6.20% | 4.00% | 4.00% |
| Revenues | $4,707 | $7,061 | $8,120 | $9,338 | $10,738 | $12,349 | $13,930 | $15,406 | $16,700 | $17,736 | $18,445 | $19,183 |
| Operating Margin | 46.14% | 46.14% | 44.92% | 44.30% | 43.69% | 43.07% | 42.46% | 41.84% | 41.23% | 40.61% | 40.00% | 40.00% |
| Operating Income | $2,172 | $3,258 | $3,647 | $4,137 | $4,691 | $5,319 | $5,914 | $6,446 | $6,885 | $7,203 | $7,378 | $7,673 |
| Tax rate | 18.00% | 18.00% | 18.00% | 18.00% | 18.00% | 18.00% | 19.40% | 20.80% | 22.20% | 23.60% | 25.00% | 25.00% |
| EBIT(1-t) | $1,781 | $2,672 | $2,990 | $3,392 | $3,847 | $4,362 | $4,767 | $5,106 | $5,357 | $5,503 | $5,533 | $5,755 |
| - Reinvestment | | $1,315 | $592 | $680 | $782 | $900 | $883 | $825 | $723 | $578 | $396 | $1,535 |
| FCFF | | $1,357 | $2,399 | $2,712 | $3,064 | $3,462 | $3,884 | $4,281 | $4,634 | $4,925 | $5,137 | $4,220 |

| | |
|---|---|
| PV(Terminal value) | $ 22,979.04 |
| PV (CF over next 10 years) | $ 17,918.97 |
| Value of operating assets = | $ 40,898.02 |
| - Debt | $ 1,237.00 |
| - Minority interests | $ 685.00 |
| + Cash | $ 1,589.00 |
| Value of equity | $ 40,565.02 |
| Number of shares | 8,301.30 |
| Estimated value /share | $ 4.89 |
| Price | $ 5.32 |

Cost of capital = 24.73% (..972) + 16.01% (.028) = 12.60%

Cost of capital decreases to 10.01% from years 6-10

**On October 17, 2022, the shares were trading at $5.32/share.**

Cost of equity = 1.85%

**Cost of Debt** *Rated B*
(4.00% + 1.15%)(1-.25)
= 2.76%

**Weights**
E = 97.2% D = 2.8%

**Riskfree Rate**:
Riskfree rate = 4.00%

+ **Beta**
1.06

x **Risk Premium**
8.33%

Unlevered beta of fertilizer business = 1.04

D/E = 2.84%

| Region | Revenues | ERP | Weight |
|---|---|---|---|
| Africa | $294 | 13.37% | 8.88% |
| Asia & Oceania | $1,177 | 7.57% | 35.55% |
| Central and South America | $476 | 11.21% | 14.38% |
| Middle East | $61 | 8.03% | 1.84% |
| North America | $356 | 6.01% | 10.75% |
| Western Europe | $947 | 7.17% | 28.60% |
| **Total** | **$3,311** | **8.33%** | **100.00%** |

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

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

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

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

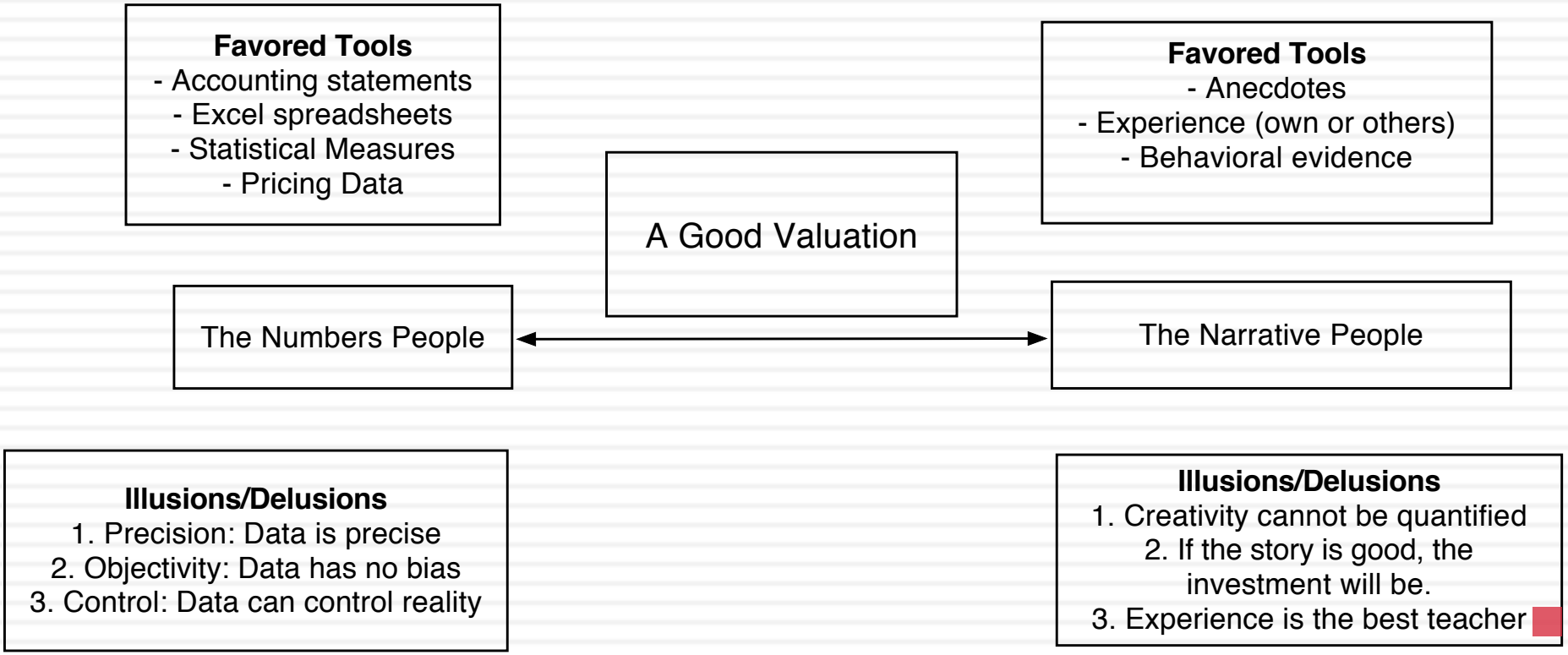
A **Kabuki DCF** is a work of art, where analyst and rule maker (or court) go through the motions of valuation, with the intent of developing models that are legally or accounting-rule defensible rather than yielding reasonable values.

**D+CF ≠ DCF**

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

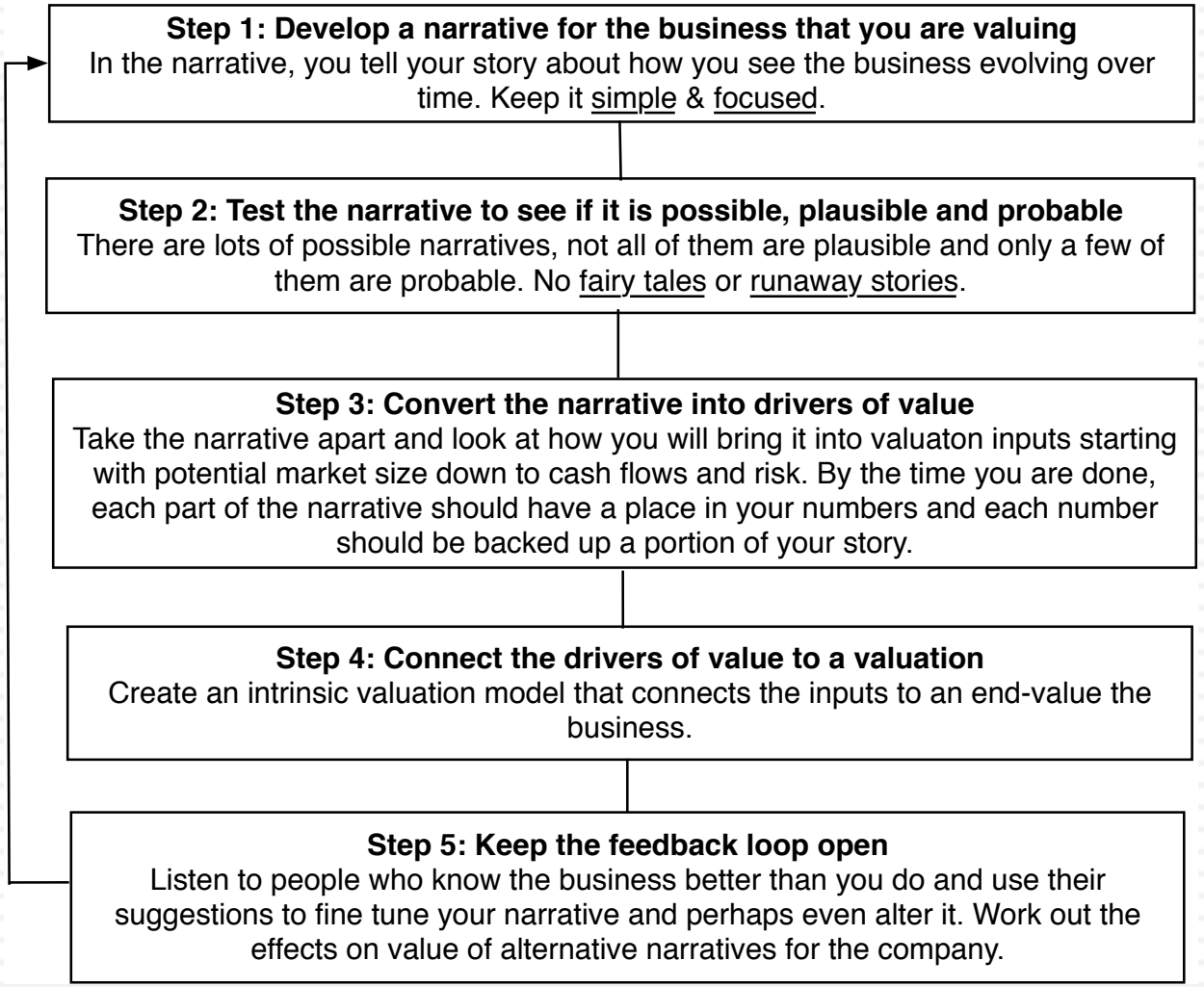
A **Mutant DCF** is a collection of numbers where items have familiar names (free cash flow, cost of capital) but the analyst putting it together has neither a narrative nor a sense of the basic principles of

# II. Don't mistake modeling for valuation



# From story to numbers and beyond..





# Step Zero: Survey the landscape

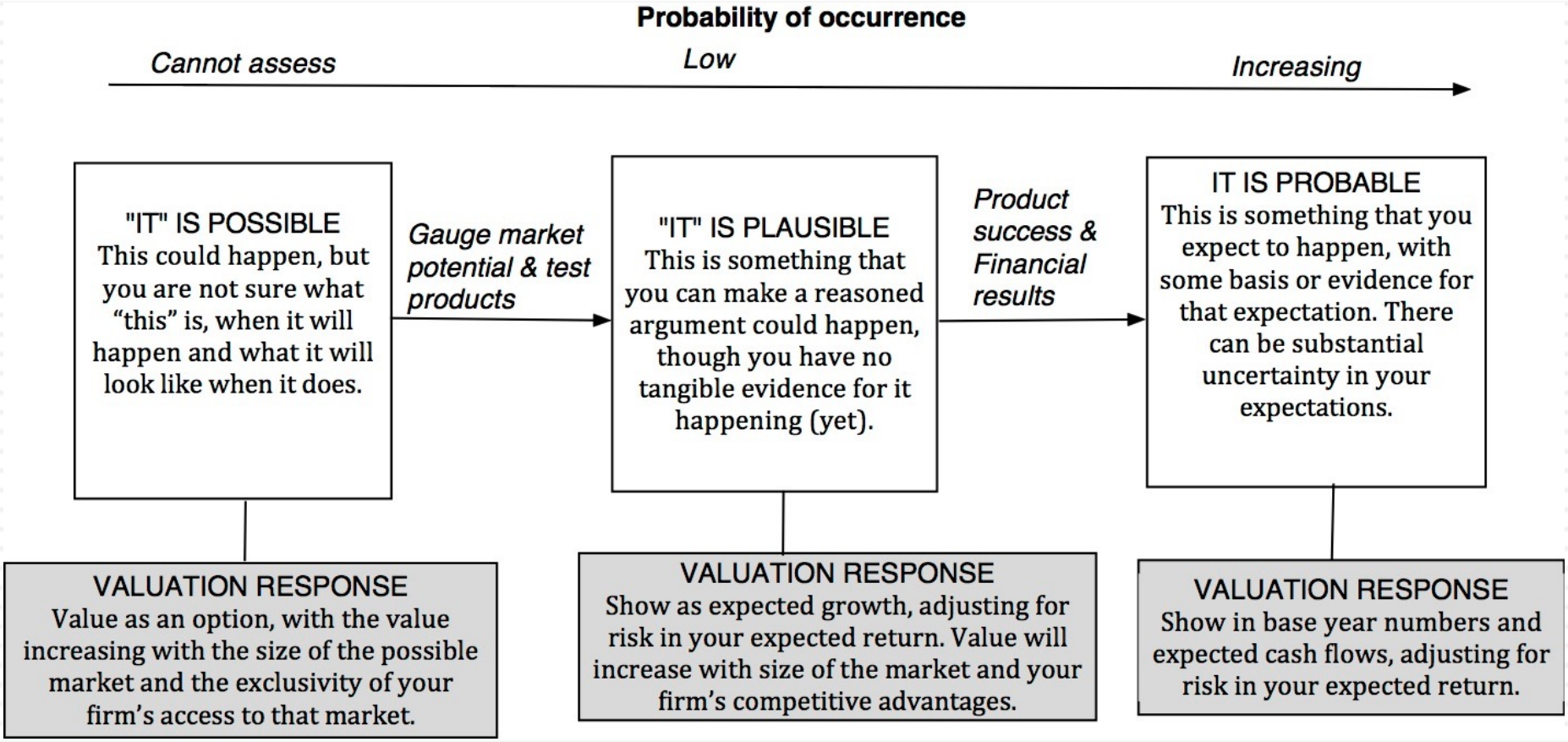
- Every valuation starts with a narrative, a story that you see unfolding for your company in the future.
- In developing this narrative, you will be making assessments of
  - Your company (its products, its management and its history.
  - The market or markets that you see it growing in.
  - The competition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

# Step 1: 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.

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





# The Impossible, The Implausible and the Improbable



## The Impossible

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

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

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

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

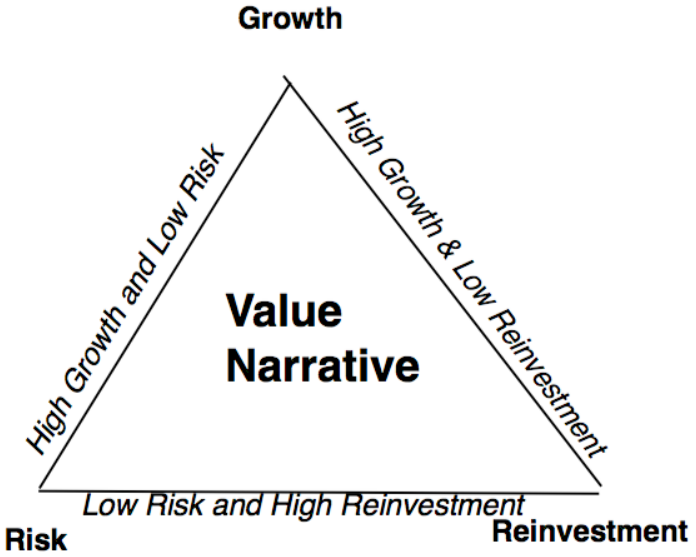
## The Implausible

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

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

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

## The Improbable



# To gauge a story's plausibility, get perspective..



- For revenue growth
  - How big is the total market for the company's product or service?
  - How big are the biggest players in the market?
  - What market share would you see a successful company get in this business? (Is it a splintered business where there will always be many players or is it a business that will tend to concentrate?)
- For profitability
  - What do operating margins look like across the business?
  - What are the causes for differences in margins (brand name, cost advantages, pricing power etc.)
- For reinvestment
  - What type of reinvestment is needed to generate growth?
  - How efficient is reinvestment across the sector?

# 1. Largest fertilizer companies in 2022



| Company Name | Revenues (LTM) |
|---|---|
| Nutrien Ltd. (TSX:NTR) | $ 34,612.00 |
| Yara International ASA (OB:YAR) | $ 21,899.00 |
| Corteva, Inc. (NYSE:CTVA) | $ 16,703.00 |
| The Mosaic Company (NYSE:MOS) | $ 16,555.00 |
| CF Industries Holdings, Inc. (NYSE:CF) | $ 10,159.00 |
| Yunnan Yuntianhua Co., Ltd. (SHSE:600096) | $ 10,061.00 |
| ICL Group Ltd (TASE:ICL) | $ 9,233.00 |
| Israel Corporation Ltd (TASE:ILCO) | $ 9,233.00 |
| OCI N.V. (ENXTAM:OCI) | $ 8,921.70 |
| Sociedad Química y Minera de Chile S.A. (NYSE:SQM) | $ 6,364.50 |
| **Fertiglobe plc (ADX:FERTIGLB)** | **$ 4,706.80** |

The total revenues in the fertilizer business in 2022 was $192 billion, growing at 4-5% a year.

# 2. Operating Margins in the business



*Fertilizer Business Operating Margins*

| *Mkt Cap Quintile* | Number | First Decile | First Quartile | Median | Third Quartile | 9th Decile |
|---|---|---|---|---|---|---|
| Smallest Market Cap | 45 | -664.50% | -60.94% | 3.06% | 7.11% | 18.75% |
| 2nd quintile | 46 | -6.62% | 6.66% | 11.83% | 15.59% | 22.28% |
| 3rd quintile | 45 | 2.15% | 6.04% | 10.99% | 16.38% | 22.83% |
| 4th quintile | 46 | 1.57% | 7.34% | 12.90% | 18.79% | 28.97% |
| Largest Market Cap | 46 | 9.95% | 13.06% | 22.42% | 31.90% | 59.08% |

*Fertiglobe: Historical Margins*

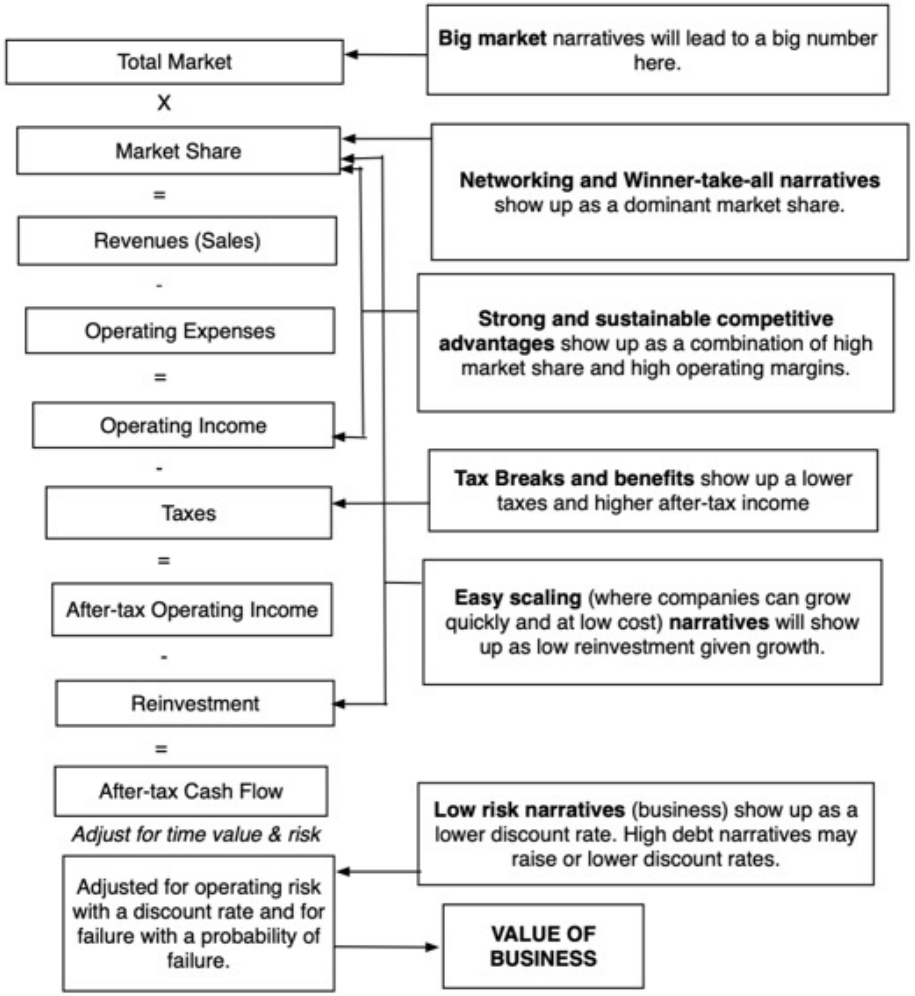
| | *Operating Income* | *Revenues* | *Operating Margin* |
|---|---|---|---|
| LTM | $ 2,172.00 | $ 4,707 | 46.14% |
| 2021 | $ 1,305.00 | $ 3,311 | 39.41% |
| 2020 | $ 182.00 | $ 1,551 | 11.73% |
| 2019 | $ 142.00 | $ 1,056 | 13.45% |
| 2018 | $ 322.00 | $ 1,238 | 26.01% |

# 3. Sales to Capital – Investment Efficiency



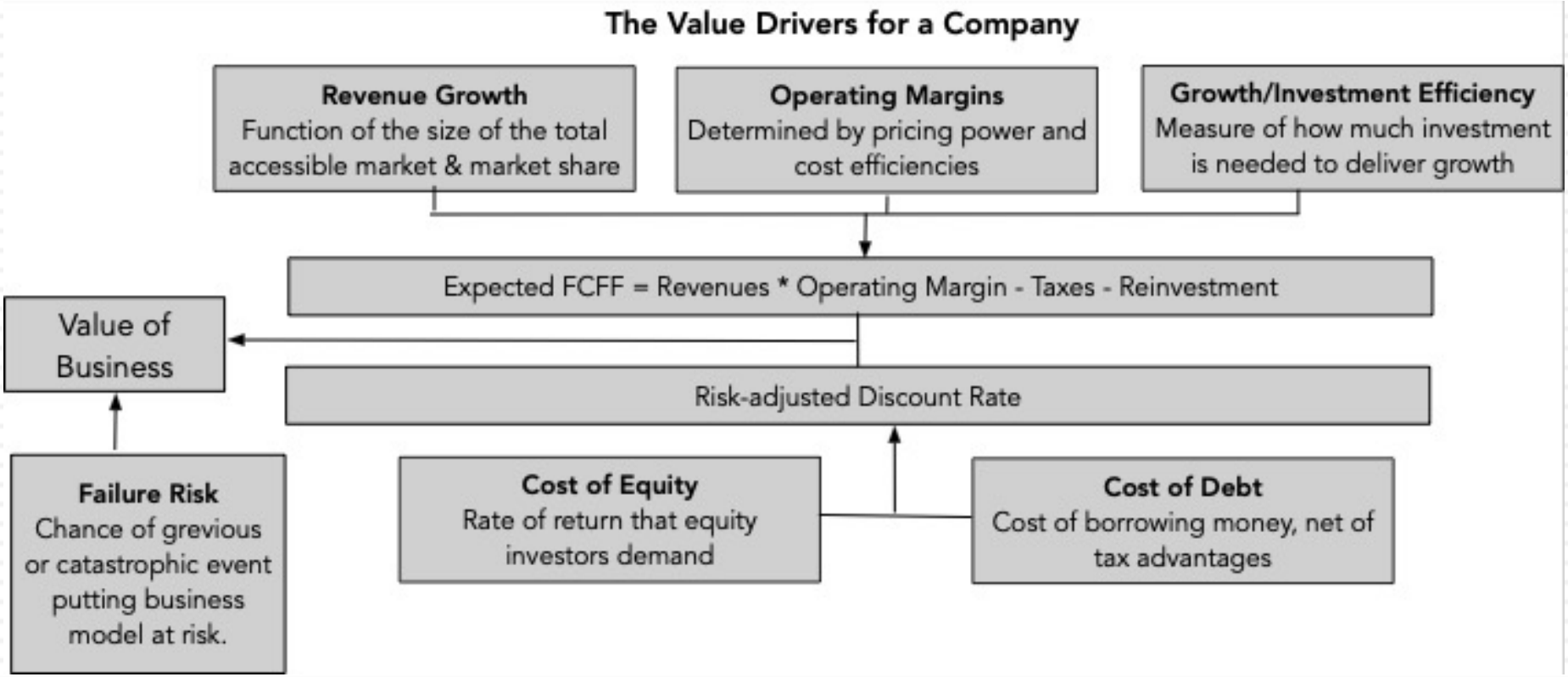
| Mkt Cap Quintile | Number | First Decile | First Quartile | Median | Third Quartile | 9th Decile |
|---|---|---|---|---|---|---|
| Smallest Market Cap | 45 | 0.01 | 0.47 | 1.37 | 2.23 | 3.68 |
| 2nd quintile | 46 | 0.53 | 0.93 | 1.47 | 2.31 | 3.18 |
| 3rd quintile | 45 | 0.66 | 1.22 | 1.71 | 2.24 | 2.75 |
| 4th quintile | 46 | 0.70 | 1.05 | 1.39 | 2.48 | 4.18 |
| Largest Market Cap | 46 | 0.66 | 0.99 | 1.75 | 2.39 | 3.50 |

# Step 3: Connect your narrative to key drivers of value



# Step 4: The Valuation





| Fertiglobe | | | | | | Oct-22 |
|---|---|---|---|---|---|---|
| ***Scaling up in mature business*** | | | | | | |
| Fertiglobe is a fast-growing and extremely profitable fertilizer company that is using cost advantages to gain market share. We expect it to continue growing, albeit at slower rates as it scales up,and it profitablity to drop from LTM levels, but to stay well above industry averagess. It is in a capital intensive business and it likely that it will have to continue reinvesting at roughly current efficiency levels for the long term. | | | | | | |
| ***The Assumptions*** | | | | | | |
| | *Base year* | *Next year* | *Years 2-5* | *Years 6-10* | *After year 10* | *Link to story* |
| Revenues (a) | $4,707.00 | 50.0% | 15.00% | 4.00% | 4.00% | Becomes to become top 5 in revenues |
| Operating margin (b) | 46.14% | 46.1% | 46.14% | 40.00% | 40.00% | Cost advantages allow company to earn higher margins than the industry (85th p) |
| Tax rate | 18.00% | | 18.00% | 25.00% | 25.00% | Global marginal tax rate over time |
| Reinvestment (c ) | | 1.79 | 1.79 | 1.79 | 26.67% | Maintined at Fertiglobe's current level |
| Return on capital | 67.59% | Marginal ROIC = | 67.83% | | 15.00% | Stronge competitive edges |
| Cost of capital (d) | | | 12.60% | 10.01% | 10.01% | Cost of capital reflects geographic exposure |
| ***The Cash Flows*** | | | | | | |
| | *Revenues* | *Operating Margin* | *EBIT* | *EBIT (1-t)* | *Reinvestment* | *FCFF* |
| 1 | $7,060.50 | 46.14% | $3,258.00 | $2,671.56 | $1,314.80 | $1,356.76 |
| 2 | $8,119.58 | 44.92% | $3,646.93 | $2,990.48 | $591.66 | $2,398.82 |
| 3 | $9,337.51 | 44.30% | $4,136.59 | $3,392.01 | $680.41 | $2,711.60 |
| 4 | $10,738.14 | 43.69% | $4,691.11 | $3,846.71 | $782.47 | $3,064.24 |
| 5 | $12,348.86 | 43.07% | $5,318.90 | $4,361.50 | $899.84 | $3,461.66 |
| 6 | $13,929.51 | 42.46% | $5,914.14 | $4,766.80 | $883.05 | $3,883.75 |
| 7 | $15,406.04 | 41.84% | $6,446.38 | $5,105.53 | $824.88 | $4,280.66 |
| 8 | $16,700.15 | 41.23% | $6,885.27 | $5,356.74 | $722.97 | $4,633.78 |
| 9 | $17,735.56 | 40.61% | $7,203.19 | $5,503.24 | $578.44 | $4,924.80 |
| 10 | $18,444.98 | 40.00% | $7,377.99 | $5,533.49 | $396.33 | $5,137.17 |
| Terminal year | $19,182.78 | 40.00% | $7,673.11 | $5,754.83 | $1,534.62 | $4,220.21 |
| ***The Value*** | | | | | | |
| Terminal value | | | $70,219.82 | | | |
| PV(Terminal value) | | | $22,979.04 | | | |
| PV (CF over next 10 years) | | | $17,918.97 | | | |
| Value of operating assets = | | | $40,898.02 | | | |
| Adjustment for distress | | | $0.00 | | Probability of failure = | 0.00% |
| - Debt & Minority Interests | | | $1,922.00 | | | |
| + Cash & Other Non-operating assets | | | $1,589.00 | | | |
| Value of equity | | | $40,565.02 | | | |
| - Value of equity options | | | $0.00 | | | |
| Number of shares | | | 8,301.30 | | | |
| Value per share | | | $4.89 | | Stock was trading at = | $5.32 |

# 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 Real World Intrudes: Be ready to modify narrative as events unfold

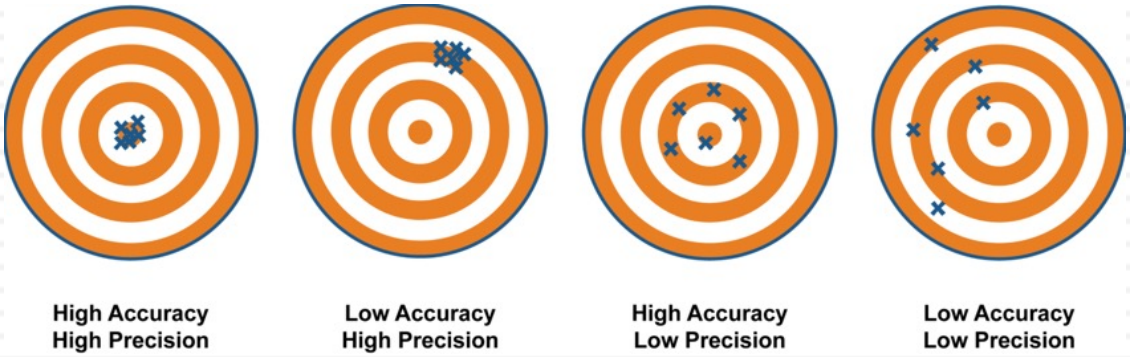


| Narrative Break/End | Narrative Shift | Narrative Change (Expansion or Contraction) |
|---|---|---|
| Events, external (legal, political or economic) or internal (management, competitive, default), that can cause the narrative to break or end. | Improvement or deterioration in initial business model, 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 |

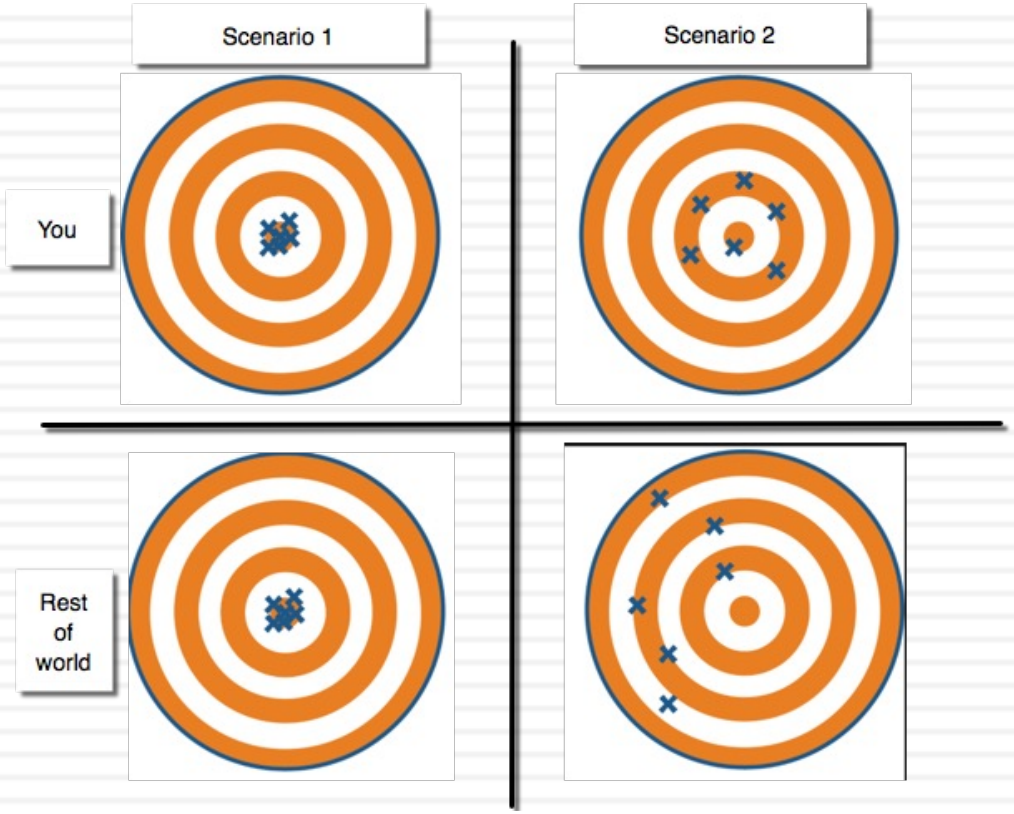
# III. Don't mistake precision for accuracy.. And accuracy for payoff..



Better accurate than precise

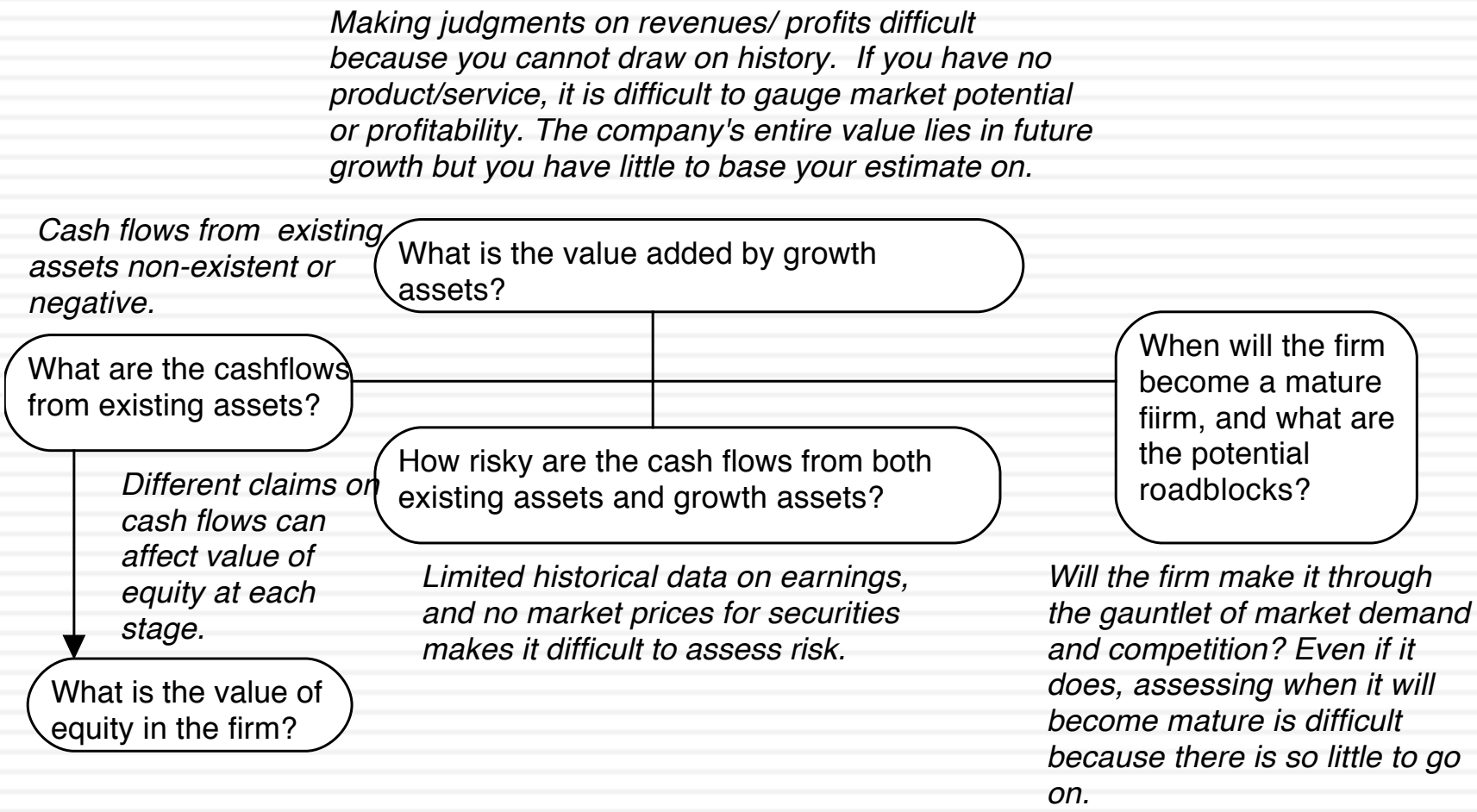



It's all relative



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

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



# And the dark side will beckon..



- With young start up companies, you will be told that it is "too difficult" or even "impossible" to value these companies, because there is so little history and so much uncertainty in the future.
- Instead, you will be asked to come over to the "dark side", where
  - You will see value metrics that you have never seen before
  - You will hear "macro" stories, justifying value
  - You will be asked to play the momentum game
- While all of this behavior is understandable, none of it makes the uncertainty go away. You have a choice. You can either hide from uncertainty or face up to it.

# A much-watched IPO

- Zomato, an Indian online food-delivery company, started trading on the Sensex on July 14, 2021, and its market debut is being watched for clues by a number of other online ventures in India, waiting in the wings to go public.
  - The primary attraction, to investors, of the company comes not from its current standing (modest revenues and big losses), but from its capacity to take advantage of the potential growth in the Indian food delivery market.
  - In this post, I will value Zomato, and rather than just make a value judgment (which I will), I will also tie the value per share to macro expectations about the overall market.
- I will argue that a bet on Zomato is as much a bet on the company's business model, as it is a bet on Indian consumers not only acquiring more buying power and digital access, but also changing their eating behavior.

# Setting the Stage: Zomato's history

- Zomato was founded in 2008 by Deepinder Goel and Pankaj Chaddah, as Foodiebay, in response to the difficulties that they noticed the difficulties that their office mates were having in downloading menus for restaurants, that they wanted to order food from.
- Their initial response was a simple one, where they uploaded soft copies of menus of local restaurants, in Delhi, on to their website, initially for people in their office, and then to everyone in the city.
- As the popularity grew, they expanded to other large Indian cities, and in 2010, they renamed the company "Zomato", with the tagline of "never have a bad meal".

# And Business Model

- Transaction Fees: The bulk of Zomato's revenues come from the transactions on its platform, from food ordering and delivery, as the company keeps a percentage of the total order value for itself. While Zomato's revenue slice varies across restaurants, decreasing with restaurant profile and reach, it remains about 20-25% of gross order value.
- Advertising: Restaurants that list on Zomato have to pay a fixed fee to get listed, but they can also spend more on advertising, based upon customer visits and resetting revenues, to get additional visibility.
- Subscriptions to Zomato Gold (Pro): Zomato also offers a subscription service, and subscribers to Zomato Gold (now Zomato Pro) get discounts on food and faster deliveries. The service was initiated in 2017 and it had 1.5 million plus members in 2021, delivering subscription revenues of 600 million rupees (a little less than $ 10 million, and less than 5% of overall revenues) in 2021.
- Restaurant Raw Material: In 2018, Zomato introduced HyperPure, a service directed at restaurants, offering groceries and meats that are source-checked for quality.

# The Food Delivery Market

| | *India* | *China* | *United States* | *EU* |
|---|---|---|---|---|
| *General* | | | | |
| GDP in 2020 (in trillions of US $) | $ 2.71 | $ 14.70 | $ 20.93 | $ 15.17 |
| Population (millions) | 1360 | 1430 | 330 | 445 |
| Per Capital GDP | $ 1,993 | $ 10,280 | $ 63,424 | $ 34,090 |
| Number of restaurants (in 000s) | 1000 | 9000 | 660 | 890 |
| *Food Delivery* | | | | |
| Online Access (percent | 43% | 63% | 88% | 90% |
| Online Food Delivery Users (millions) | 50.00 | 450.00 | 105.00 | 150.00 |
| Online Food Delivery Market ($ million) in 2019 | $ 4,200 | $ 90,000 | $ 21,000 | $ 15,000 |
| Online Food Delivery Market ($ million) in 2020 | $ 2,900 | $ 110,000 | $ 49,000 | $ 13,800 |

# Difference Drivers

- Lower per-capita income: Eating out and prosperity don't always go hand in hand, but you are more likely to eat out, as your discretionary income rises. Thus, it should come as no surprise that the number of restaurants increases with per capita GDP, and that one reason for the paucity of restaurants(and food delivery) in India is its low GDP, less than a fifth of per capital GDP in China and a fraction of per capital GDP in the US & EU.
- Less digital reach: To use online restaurant services, you first need to be online, and digital reach in India, in spite of advances in recent years, lags digital reach in China, and is about half the reach in the US and the EU.
- Eating habits: Looking across the regions, it seems clear that there is a third factor at play, a pre-disposition to eat out in the populace. Looking at the number of restaurants in China and the size of its food delivery market, it is quite clear that Chinese consumers are far more willing to eat out (either in person at or with delivery from restaurants) than people living in the US and EU, especially if you control for per capita income differences.

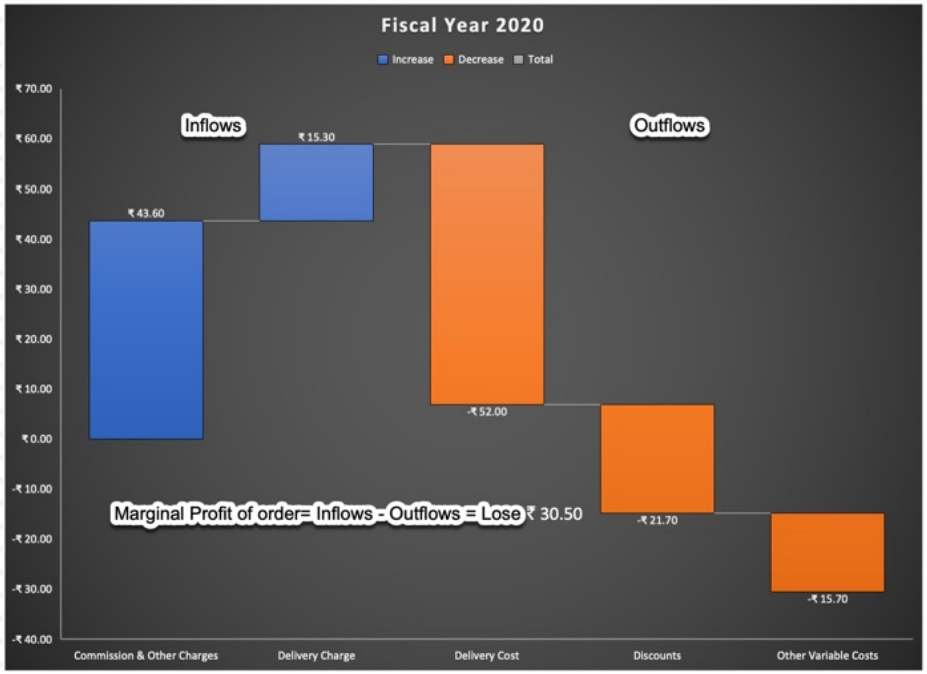
# Indian Market Size, adjusted for income and digital reach…

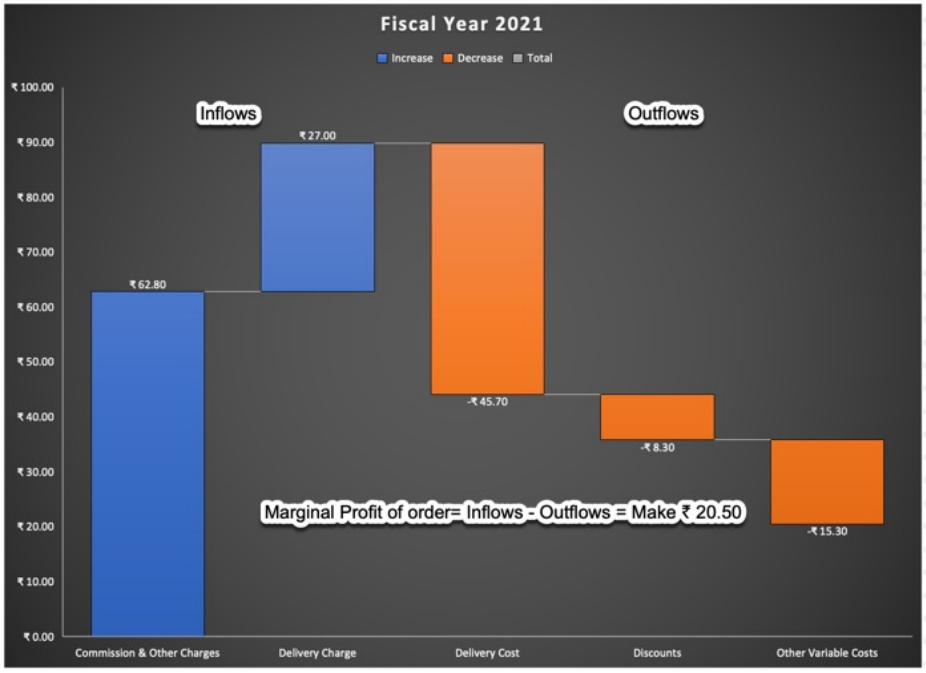
| | *Indian Per Capita GDP as % of China Per Capita GDP* | | | |
|---|---|---|---|---|
| | 25% | 50% | 75% | 100% |
| Current Internet access | $5,417 | $10,834 | $16,250 | $21,667 |
| China-level Internet access | $7,936 | $15,872 | $23,809 | $31,745 |
| US-level Internet access | $11,085 | $22,171 | $33,256 | $44,342 |

# Growth & Profitability Trends

| *Fiscal Year ended* | *3/31/18* | *3/31/19* | *3/31/20* | *3/31/21* |
|---|---|---|---|---|
| Gross Order Value | **₹ 19,154.25** | ₹ 53,870.10 | ₹ 112,209.00 | ₹ 94,828.70 |
| Total Revenue | ₹ 4,660.23 | ₹ 13,125.86 | ₹ 26,047.37 | ₹ 19,937.89 |
| Cost Of Goods Sold | ₹ 2,963.53 | ₹ 6,269.94 | ₹ 9,229.39 | ₹ 9,455.04 |
| **Gross Profit** | **₹ 1,696.70** | **₹ 6,855.92** | **₹ 16,817.98** | **₹ 10,482.85** |
| Selling General & Admin Exp. | ₹ 944.06 | ₹ 12,629.44 | ₹ 13,771.49 | ₹ 5,823.91 |
| Provision for Bad Debts | ₹ 18.31 | ₹ 29.47 | ₹ 124.95 | ₹ 88.42 |
| R & D Exp. | - | - | - | - |
| Depreciation & Amort. | ₹ 291.47 | ₹ 431.15 | ₹ 842.36 | ₹ 431.99 |
| Other Operating Expense/(Income) | ₹ 1,641.21 | ₹ 16,630.87 | ₹ 25,966.51 | ₹ 8,941.29 |
| **Operating Income** | **-₹ 1,198.40** | **-₹ 22,865.00** | **-₹ 23,887.30** | **-₹ 4,802.76** |
| Interest Expense | -₹ 52.80 | -₹ 70.60 | -₹ 110.20 | -₹ 63.95 |
| Interest and Invest. Income | ₹ 73.10 | ₹ 133.46 | ₹ 264.90 | ₹ 223.75 |
| Net Interest Exp. | ₹ 20.32 | ₹ 62.84 | ₹ 154.66 | -₹ 287.70 |
| Currency Exchange Gains (Loss) | -₹ 16.90 | -₹ 0.30 | -₹ 0.90 | ₹ 24.83 |
| Other Non-Operating Inc. (Exp.) | ₹ 8.72 | -₹ 10.70 | ₹ 266.44 | ₹ 289.94 |
| **EBT Excl. Unusual Items** | **-₹ 1,186.30** | **-₹ 22,813.20** | **-₹ 23,467.10** | **-₹ 4,328.19** |
| Impairment of Goodwill | - | - | -₹ 962.70 | ₹ 0.00 |
| Gain (Loss) On Sale Of Invest. | ₹ 94.85 | ₹ 600.82 | ₹ 513.91 | ₹ 612.30 |
| Gain (Loss) On Sale Of Assets | ₹ 2.96 | ₹ 0.31 | ₹ 0.86 | ₹ 0.00 |
| Asset Writedown | -₹ 0.10 | -₹ 0.10 | -₹ 155.20 | ₹ 0.00 |
| Other Unusual Items | ₹ 19.39 | ₹ 12,109.81 | ₹ 214.27 | ₹ 0.00 |
| **EBT Incl. Unusual Items** | **-₹ 1,069.20** | **-₹ 10,102.30** | **-₹ 23,856.00** | **-₹ 8,164.28** |
| Income Tax Expense | - | - | - | - |
| Earnings from Cont. Ops. | -₹ 1,069.20 | -₹ 10,102.30 | -₹ 23,856.00 | -₹ 8,164.28 |
| Minority Int. in Earnings | ₹ 32.39 | ₹ 452.86 | ₹ 184.43 | ₹ 36.12 |
| **Net Income** | **-₹ 1,036.80** | **-₹ 9,649.50** | **-₹ 23,671.60** | **-₹ 8,128.16** |

# Unit Economics



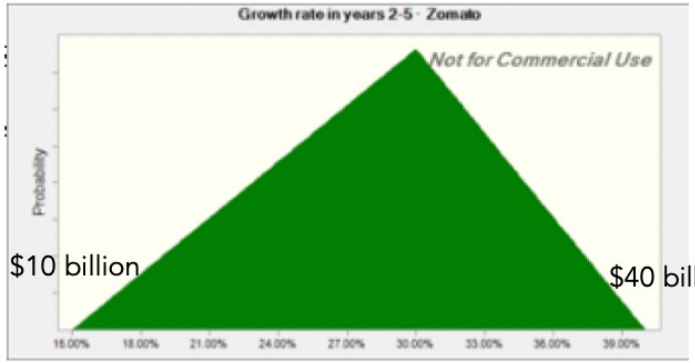



# Zomato: Story Pieces

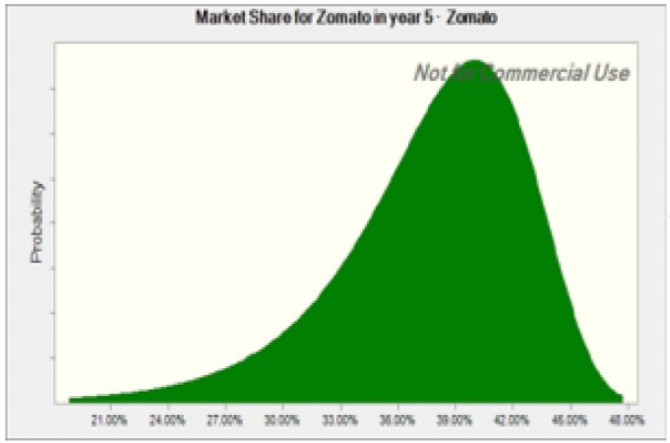
- Total Market:, I find it hard to see the *total market exceeding $40 billion, with US $20-$30 billion, in ten years,* being a more likely outcome. (In rupee terms, this will translate into a market that is roughly 1800-2000 billion INR.)
- Market Share: Expecting any company to have a *market share that exceeds 40%* of this market is a reach, and I will assume that Zomato will be one of the winners/survivors
- Revenue Share: That number was 23.13% in FY 2020, but dropped to 21.03% in FY 2021, as shut downs put a crimp on business. I will assume a *partial bounce back to 22% of GOV*, starting in 2022, but the presence of Amazon Food will prevent a return to higher values in the future.
- Profitability: I will assume that *pre-tax operating margins will trend towards 30%*, largely because I believe that the market will be dominated by a few big players, but with the very real possibility that one rogue player that is unwilling to play the game can upend profitability.
- Reinvestment: One of the advantages of being an intermediary business is that you can grow with relatively little capital investment, defined in conventional form (as plant, equipment or manufacturing facilities). That said, reinvestment takes a different form for online intermediaries, like Zomato, with investments in technology and in acquisitions, driving future growth.
- Risk: In terms of operating risk, the company, in spite of its global ambitions, is still primarily an Indian company, dependent on Indian macroeconomic growth to succeed, and my rupee cost of capital will incorporate the country risk. Zomato is a money losing company, but it is no start-up, facing imminent failure. On the plus side, its size and access to capital, as well as its post-IPO augmented cash balance, push down the risk of failure. Overall, I will attach a likelihood of failure of 10%, reflecting this balance.

| Zomato | | | | | | Jul-21 |
|---|---|---|---|---|---|---|
| ***The Story*** | | | | | | |
| Zomato will benefit as the Indian food delivery market grows, driven by overall economic growth and more digital access, and it will be one of a few (two or three) players who will dominate the market; there will be a near term COVID bouncecback effect. While Amazon Food remains the wild card, economies of scales will allow the company to generate high operating margins, and the company will continue to reinvest (acquisitions and technology) as it grows. The risk of failure is low, given the company's post-IPO cash balance and access to capital and its operating risk reflects its exposure to Indian country risk. | | | | | | |
| ***The Assumptions*** | | | | | | |
| | *Base year* | *Next year* | *Years 2-5* | *Years 6-10* | *After year 10* | *Link to story* |
| Indian Food Delivery | ₹ 225,000 | ₹ 337,500 | 30.00% | 15.27% | ₹ 1,961,979 | *Indian food market rebounds in 2021 and growsto about $25 billion in year 10* |
| Market Share | 42.15% | 41.72% | → | 40.00% | 40.00% | *Zomato is one of two or three lead players in Indian food delivery market* |
| Revenues as % of GOV | 21.03% | 22.00% | | | 22.00% | |
| Revenues (a) | ₹ 19,937.89 | ₹ 30,975 | Total Market * Market Share* Revenue as % of GOV | | ₹ 172,654 | COVID rebound in 2021 + Growth in food delivery market in India long term |
| Operating margin (b) | -24.10% | -10.0% | -10.00% → | 35.00% | 35.00% | Margins improve as growth wanes |
| Tax rate | 30.00% | | 30.00% → | 30.00% | 30.00% | Indian corporate tax rate over time |
| Reinvestment (c ) | | 5.00 | 2.50 | 3.00 | 35.42% | Acquisitions & technology investments needed to sustain growth |
| Return on capital | -7.15% | Marginal ROIC = | 127.01% | | 12.00% | Newworking benefits allow for high ROIC, near and long term. |
| Cost of capital (d) | | | 10.25% → | 8.97% | 8.97% | Cost of capital reflects Indian country risk |
| ***The Cash Flows*** | | | | | | |
| | *Total Market* | *Market Share* | *Revenues* | *EBIT (1-t)* | *Reinvestment* | *FCFF* |
| 1 | ₹ 337,500 | 41.72% | ₹ 30,974.78 | -₹ 3,097.48 | ₹ 2,207.38 | -₹ 5,304.86 |
| 2 | ₹ 438,750 | 41.29% | ₹ 39,852.91 | ₹ 498.16 | ₹ 3,551.25 | -₹ 3,053.09 |
| 3 | ₹ 570,375 | 40.86% | ₹ 51,270.19 | ₹ 3,247.17 | ₹ 4,566.91 | -₹ 1,319.74 |
| 4 | ₹ 741,488 | 40.43% | ₹ 65,951.07 | ₹ 5,770.72 | ₹ 5,872.35 | -₹ 101.64 |
| 5 | ₹ 963,934 | 40.00% | ₹ 84,826.17 | ₹ 10,762.32 | ₹ 6,291.70 | ₹ 4,470.62 |
| 6 | ₹ 1,203,471 | 40.00% | ₹ 105,905.47 | ₹ 14,994.01 | ₹ 7,026.43 | ₹ 7,967.57 |
| 7 | ₹ 1,440,555 | 40.00% | ₹ 126,768.85 | ₹ 24,503.10 | ₹ 6,954.46 | ₹ 17,548.64 |
| 8 | ₹ 1,650,156 | 40.00% | ₹ 145,213.72 | ₹ 35,577.36 | ₹ 6,148.29 | ₹ 29,429.07 |
| 9 | ₹ 1,805,271 | 40.00% | ₹ 158,863.81 | ₹ 38,921.63 | ₹ 4,550.03 | ₹ 34,371.60 |
| 10 | ₹ 1,881,995 | 40.00% | ₹ 165,615.52 | ₹ 40,575.80 | ₹ 2,250.57 | ₹ 38,325.23 |
| Terminal year | ₹ 1,961,979 | 40.00% | ₹ 172,654.18 | ₹ 42,300.27 | ₹ 14,981.35 | ₹ 27,318.93 |
| ***The Value*** | | | | | | |
| Terminal value | | | ₹ 578,790.83 | | | |
| PV(Terminal value) | | | ₹ 225,869.40 | | | |
| PV (CF over next 10 years) | | | ₹ 50,979.90 | | | |
| Value of operating assets = | | | ₹ 276,849.30 | | | |
| Adjustment for distress | | | ₹ 13,842.46 | Probability of failure = | | 10.00% |
| - Debt & Minority Interests | | | ₹ 1,591.72 | | | |
| + Cash & Other Non-operating assets | | | ₹ 135,959.70 | Includes cash proceeds from IPO of | | ₹ 90,000 |
| Value of equity | | | ₹ 397,374.81 | | | |
| - Value of equity options | | | ₹ 73,244.53 | | | |
| Number of shares | | | 7,946.68 | | | |
| Value per share | | | ₹ 40.79 | Stock was offered at = | | ₹ 70.00 |

Growth in Indian Food Delivery Market

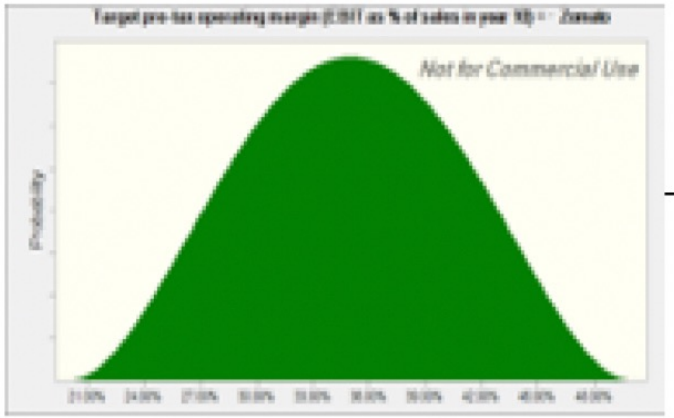



Zomato's Market Share

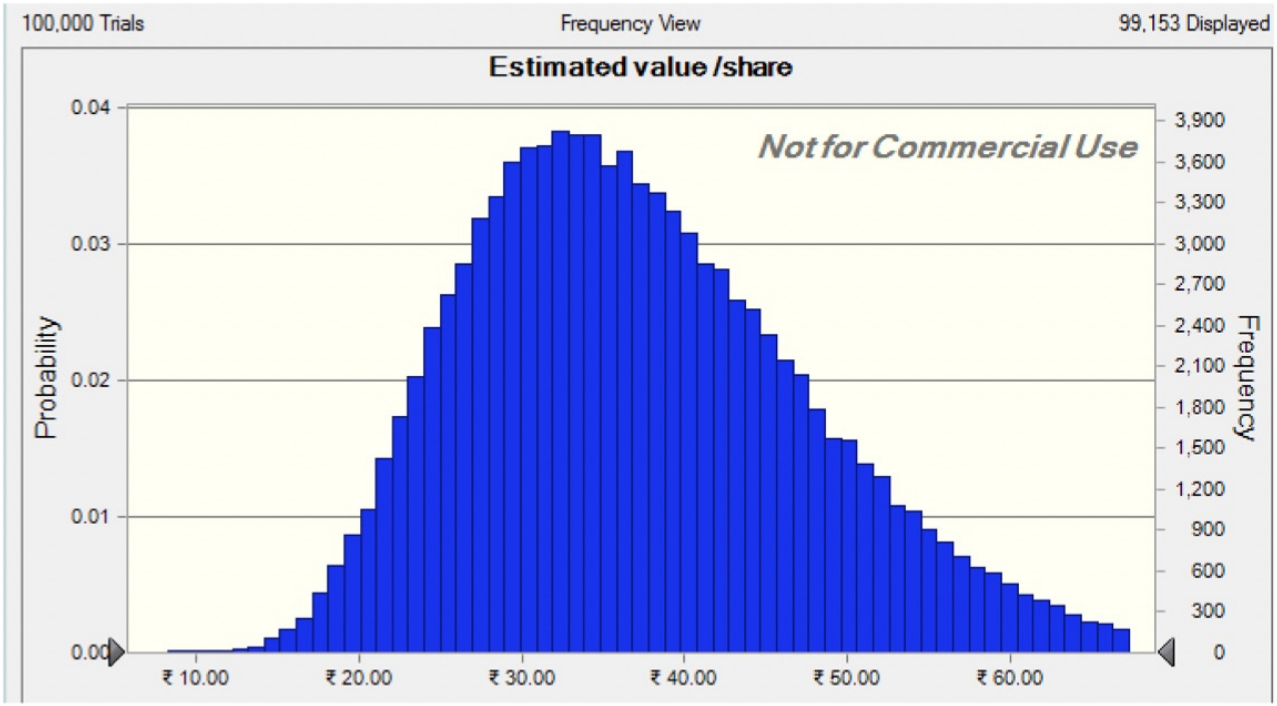



Correlation = 0.50

Zomato's Operating Margin (Pre-tax)




# Zomato: Monte Carlo Simulation of Value/Share




| *Percentile* | *Value per share* |
|---|---|
| 0% | -₹ 0.22 |
| 10% | ₹ 24.49 |
| 20% | ₹ 27.96 |
| 30% | ₹ 30.74 |
| 40% | ₹ 33.35 |
| 50% | ₹ 36.02 |
| 60% | ₹ 28.86 |
| 70% | ₹ 42.11 |
| 80% | ₹ 46.07 |
| 90% | ₹ 51.92 |
| 100% | ₹ 91.69 |

# Add-ons and Distractions: Platform Optionality

- As a company with millions of users on its platform, if Zomato can deliver other products and services to the users of the platform, it can augment its earnings and value.
  - First, not all platforms are created equal, in terms of being adding value, with platforms with more intense users and proprietary data having more value than platforms where users are transitory and there is little exclusive data being collected.
  - Second, even if you believe that there is optionality, attach a numerical value to that option is one of the most difficult tasks in investment. While there are option pricing models that can be adapted to do the valuation, getting the inputs for these models, especially before the optionality takes form, is difficult to do.

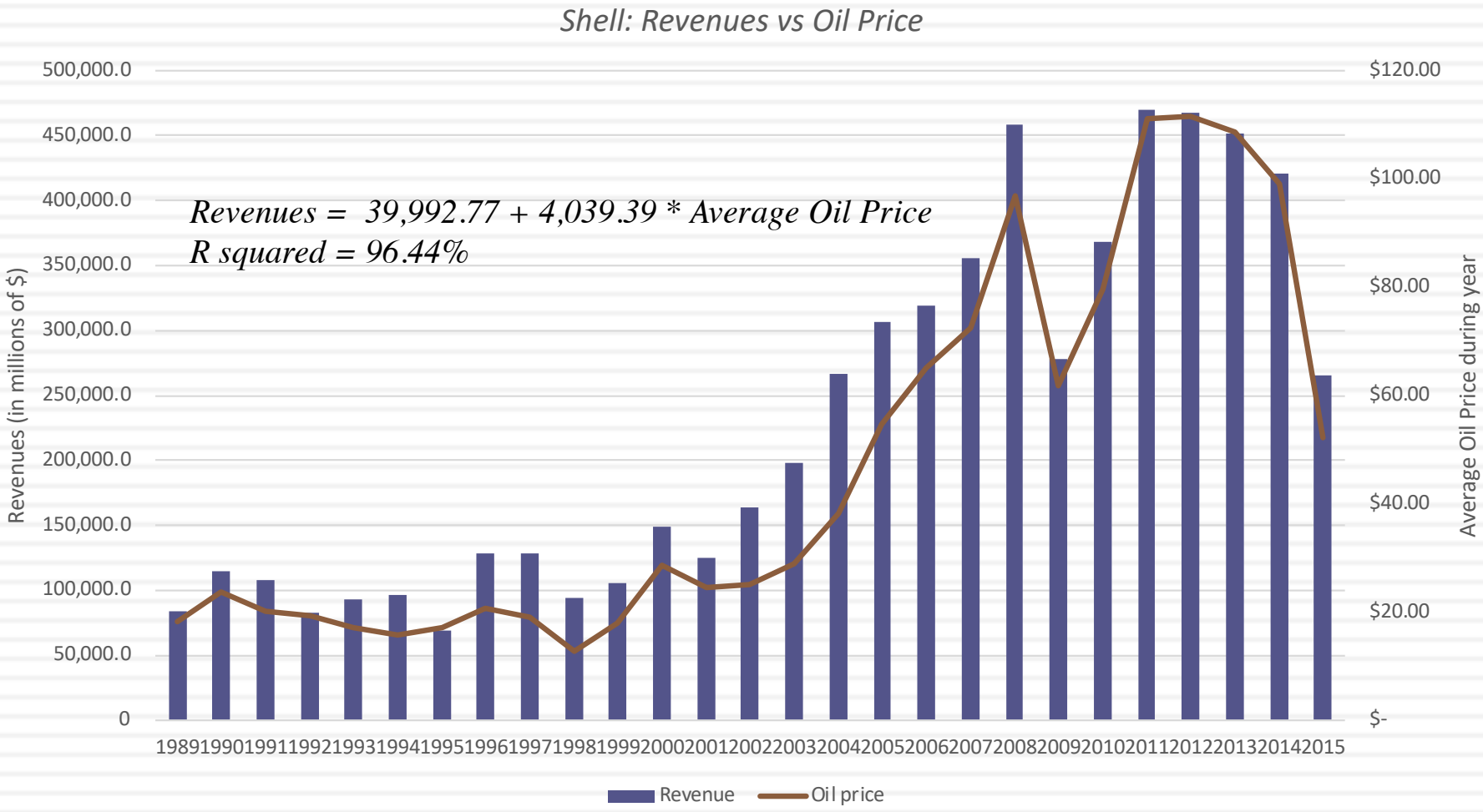
# A Big Market Premium?

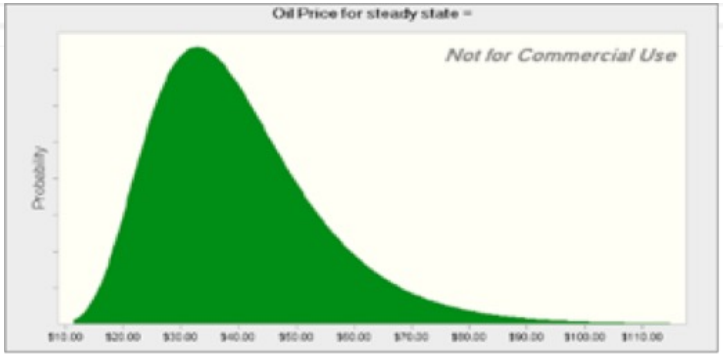
- Indian and Chinese companies, especially in young and nascent businesses, have an advantage that they often play to, which is immense local markets. It is not surprising that companies play up this advantage, when marketing themselves to investors, with some analysts attaching premiums to value, just because of market size.
  - Double counting: I believe that this is a distraction, because that market size should already by incorporated into the intrinsic value, through growth and margin expectations. In my base case valuation of Zomato, I assume that revenues will increase more than twenty-fold over the next 10 years, because the Indian market is expected to grow so strongly.
  - The Big Market Delusion: In fact, the danger to investors, when faced with Indian and Chinese companies, is not that they will under value these companies, but that they will over value them, precisely because the markets are so big.

# With macro uncertainty…

- If there is a key macro variable affecting the value of your company that you are uncertain about (and who is not), why not quantify the uncertainty in a distribution (rather than a single price) and use that distribution in your valuation.
- That is exactly what you do in a Monte Carlo simulation, where you allow one or more variables to be distributions and compute a distribution of values for the company.
- With a simulation, you get not only everything you would get in a standard valuation (an estimated value for your company) but you will get additional output (on the variation in that value and the likelihood that your firm is under or over valued)

# Shell's Revenues & Oil Prices



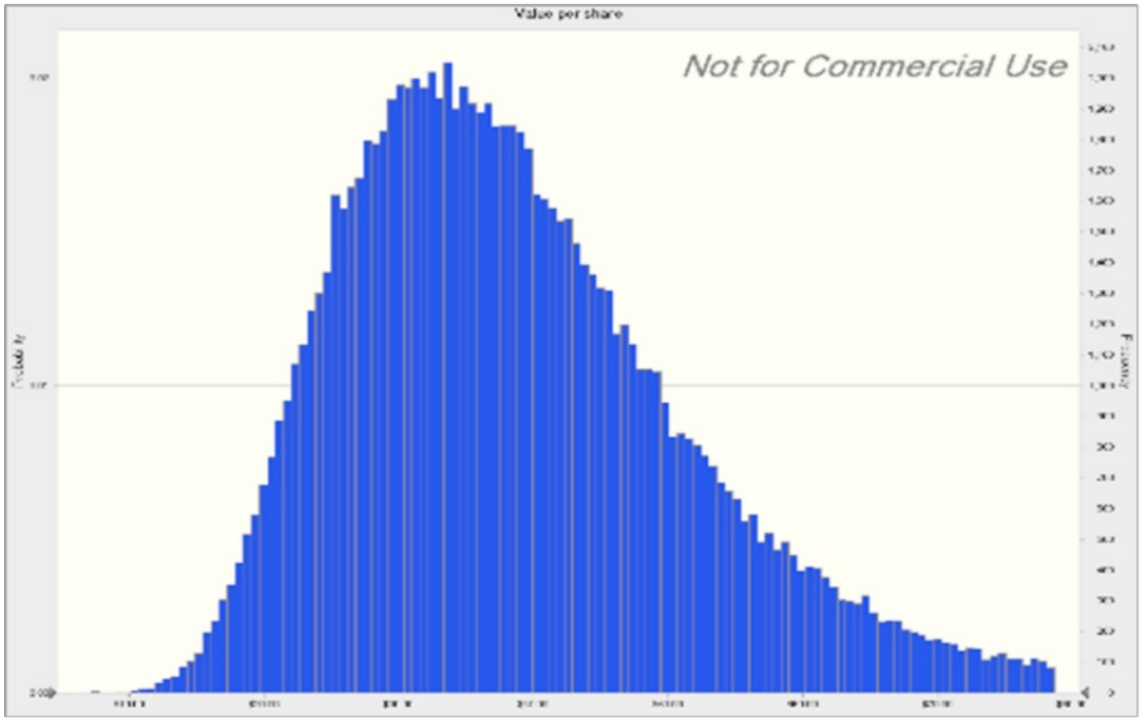



**Revenue calculated from the oil price drawn from distribution**
Revenue = 39992.77+4039.40*Oil Price/Barrel

**Pre-tax Operating Income based on revenue & selected margin**
Pre-tax Operating Income = Revenues * Operating Margin


Value Shell based on operating income, assuming other assumptions (tax rate, revenue growth, cost of capital

| Percentiles: | Forecast values |
|---|---|
| 0% | $6.55 |
| 10% | $23.90 |
| 20% | $27.73 |
| 30% | $30.89 |
| 40% | $33.88 |
| 50% | $36.99 |
| 60% | $40.28 |
| 70% | $44.22 |
| 80% | $49.24 |
| 90% | $57.49 |
| 100% | $197.11 |



# IV. 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

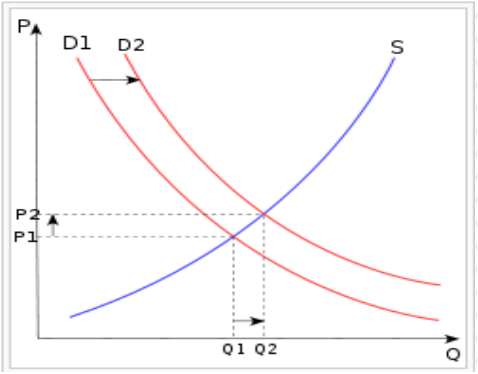
INTRINSIC VALUE

Value

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

Price

PRICE



# Value versus Price: Categories

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

# The determinants of price



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

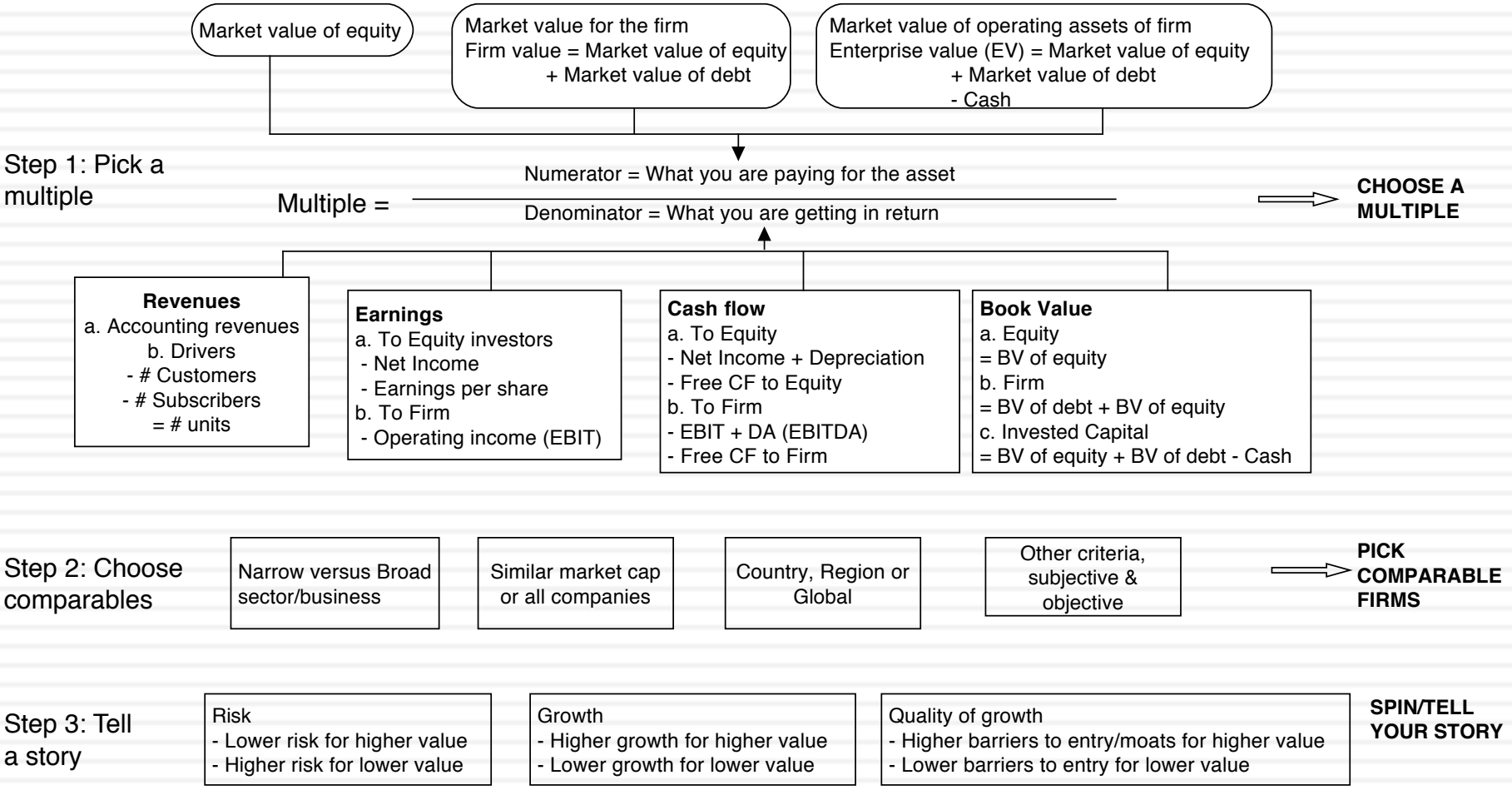
**Liquidity & Trading Ease**
While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

The Market Price

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

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

# Multiples and Comparable Transactions



# The Four Steps to Deconstructing Multiples

- Define the multiple
  - In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated
- Describe the multiple
  - Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.
- Analyze the multiple
  - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- Apply the multiple
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

# Fertiglobe: A Pricing

| Company Name | EV/Sales | Operating Margin | PBV | ROE | PE |
|---|---|---|---|---|---|
| Nutrien Ltd. (TSX:NTR) | 1.53 | 27.01% | 1.58 | 25.93% | 6.10 |
| Yara International ASA (OB:YAR) | 0.61 | 14.71% | 1.28 | 19.58% | 6.56 |
| Corteva, Inc. (NYSE:CTVA) | 2.49 | 15.30% | 1.63 | 6.67% | 24.51 |
| The Mosaic Company (NYSE:MOS) | 1.18 | 28.17% | 1.38 | 27.70% | 4.97 |
| CF Industries Holdings, Inc. (NYSE:CF) | 2.00 | 50.35% | 4.26 | 55.96% | 7.61 |
| Yunnan Yuntianhua Co., Ltd. (SHSE:600096) | 0.86 | 12.37% | 3.07 | 42.86% | 7.15 |
| ICL Group Ltd (TASE:ICL) | 1.43 | 30.15% | 2.13 | 33.05% | 6.44 |
| Israel Corporation Ltd (TASE:ILCO) | 0.65 | 30.17% | 1.50 | 23.43% | 6.40 |
| OCI N.V. (ENXTAM:OCI) | 1.05 | 34.64% | 3.06 | 43.98% | 6.95 |
| Sociedad Química y Minera de Chile S.A. (NYSE:SQM) | 3.72 | 48.44% | 6.68 | 58.93% | 11.33 |
| UPL Limited (BSE:512070) | 1.42 | 17.01% | 1.99 | 15.51% | 12.80 |
| FMC Corporation (NYSE:FMC) | 3.21 | 22.42% | 4.49 | 22.28% | 20.16 |
| ADAMA Ltd. (SZSE:000553) | 0.94 | 7.38% | 0.90 | 2.32% | 38.73 |
| Grupa Azoty S.A. (WSE:ATT) | 0.33 | 13.24% | 0.28 | 19.64% | 1.43 |
| K+S Aktiengesellschaft (XTRA:SDF) | 0.91 | 27.50% | 0.59 | 39.75% | 1.47 |
| **Fertiglobe plc (ADX:FERTIGLB)** | **2.49** | **46.15%** | **5.24** | **56.05%** | **9.35** |
| Shandong Hualu-Hengsheng Chemical Co., Ltd. (SHSE:600426) | 1.79 | 30.06% | 2.26 | 31.73% | 7.13 |
| SABIC Agri-Nutrients Company | 4.33 | 61.18% | 4.59 | 53.52% | 8.59 |
| KG Chemical Corporation (KOSE:A001390) | 0.22 | 9.87% | 0.41 | 26.75% | 1.54 |
| The Scotts Miracle-Gro Company | 1.47 | 11.07% | 5.73 | -63.48% | NA |
| First Quartile | 0.90 | 14.34% | 1.35 | 19.63% | 6.25 |
| Median | 1.42 | 27.25% | 2.06 | 27.22% | 7.13 |
| Third Quartile | 2.13 | 31.29% | 4.32 | 43.14% | 10.34 |

# Follow the yellow brick road..