

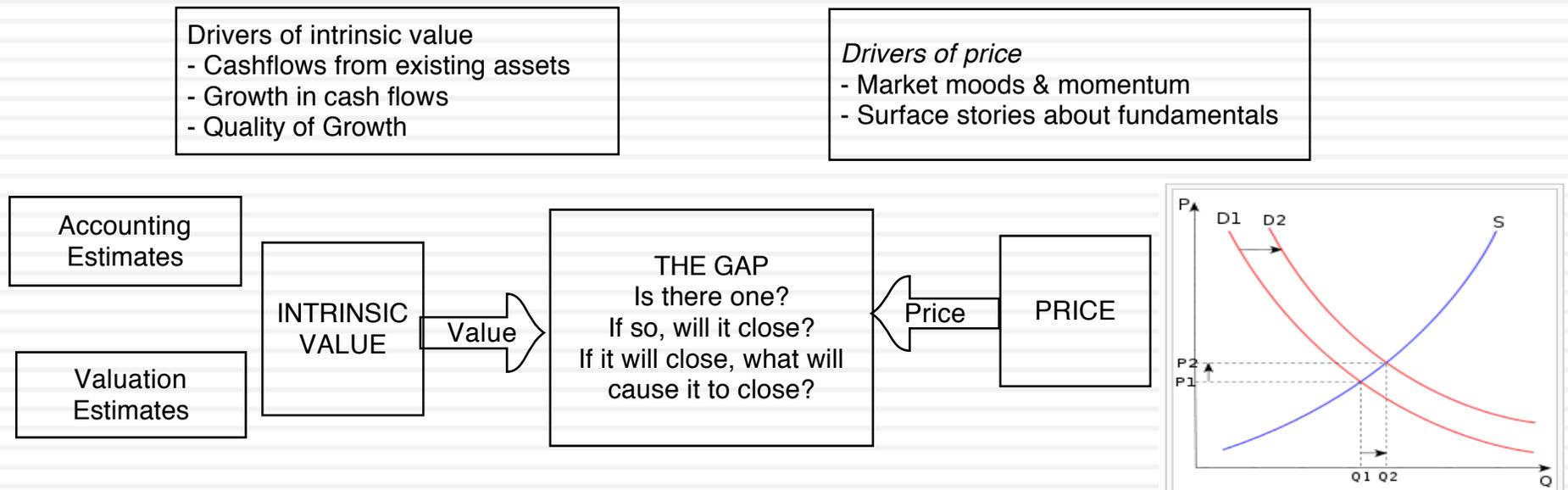
Price and value: what's your game?

January 2023

Aswath Damodaran

Price versus Value: The Set up

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Test 1: Are you pricing or valuing?

3



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

\$995,000
Price

3
Beds

2.5
Baths

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

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

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



1 of 25 Play Video

Lisa Padilla
REDFIN Real Estate Agent

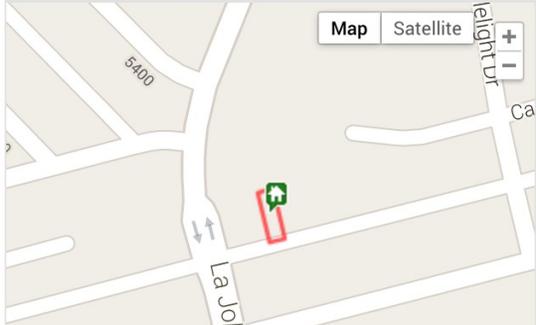
★★★★★
47 client reviews

\$8,726 commission refund

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1 of 4 Redfin Agents in this area



Test 2: Are you pricing or valuing?

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Rating
Buy

Europe
Switzerland

Biotechnology
Biotechnology

Company
BB BIOTECH

Reuters
BION.S

Bloomberg
BION SW

Exchange
SWX

Ticker
BION

Date
13 August 2013

Forecast Change

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

Strong sector and stock-picking continue

Impressive performance

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

Biotech industry remains attractive

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

BB Biotech shares remain attractive

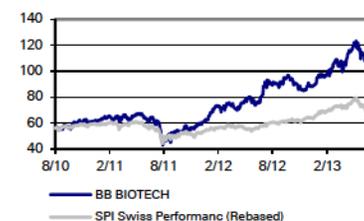
In the first 6M of 2013, BB Biotech increased its NAV by 36%, which marks good outperformance against the Nasdaq Biotech Index (NBI)'s 27%. This is a remarkable performance after 2012 when BBB's NAV increase of 45% also

Key changes

Target Price 106.50 to 164.50 ↑ 54.5%

Source: Deutsche Bank

Price/price relative



Performance (%)	1m	3m	12m
Absolute	-1.4	5.4	37.4
SPI Swiss Performance IX	0.5	-1.4	26.4

Source: Deutsche Bank

Test 3: Are you pricing or valuing?

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A Venture Capital “Valuation”

Today

Young software company
Revenues = \$2 m
Earnings (Loss) = -\$1 m

Exit Year (Year 3)

Estimated revenues = \$50 m
Estimated earnings = \$10 million
Exit Earnings Multiple = 20
Estimated Exit Value = \$10 * 20 = \$200 m

Value today
= $200/1.5^3$
= \$59.26 m

Discount back at target rate of return on 50%

Test 4: Are you pricing or valuing?

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	1	2	3	4	5
EBITDA	\$100.00	\$120.00	\$144.00	\$172.80	\$207.36
- Depreciation	\$20.00	\$24.00	\$28.80	\$34.56	\$41.47
EBIT	\$80.00	\$96.00	\$115.20	\$138.24	\$165.89
- Taxes	\$24.00	\$28.80	\$34.56	\$41.47	\$49.77
EBIT (1-t)	\$56.00	\$67.20	\$80.64	\$96.77	\$116.12
+ Depreciation	\$20.00	\$24.00	\$28.80	\$34.56	\$41.47
- Cap Ex	\$50.00	\$60.00	\$72.00	\$86.40	\$103.68
- Chg in WC	\$10.00	\$12.00	\$14.40	\$17.28	\$20.74
FCFF	\$16.00	\$19.20	\$23.04	\$27.65	\$33.18
Terminal Value					\$1,658.88
Cost of capital	8.25%	8.25%	8.25%	8.25%	8.25%
Present Value	\$14.78	\$16.38	\$18.16	\$20.14	\$1,138.35
Value of operating assets today	\$1,207.81				
+ Cash	\$125.00				
- Debt	\$200.00				
Value of equity	\$1,132.81				

Test 5: Are you pricing or valuing?

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- In FAS 157, here is what it says: “The exchange price is the price in an orderly transaction between market participants to sell the asset or transfer ... The transaction to sell the asset or transfer the liability is a hypothetical transaction at the measurement date, considered from the perspective of a market participant that holds the asset or owes the liability. Therefore, the definition focuses on the price that would be received to sell the asset or paid to transfer the liability (an exit price), not the price that would be paid to acquire the asset or received to assume the liability (an entry price).”
- If you are an accountant, given the task of putting FAS 157 into practice, are you being asked to
 - a. Value the assets/liabilities on a balance sheet
 - b. Price the assets/liabilities on a balance sheet



INTRINSIC VALUATION CASH FLOWS, GROWTH & RISK

Intrinsic value is simple: We choose to make it complex

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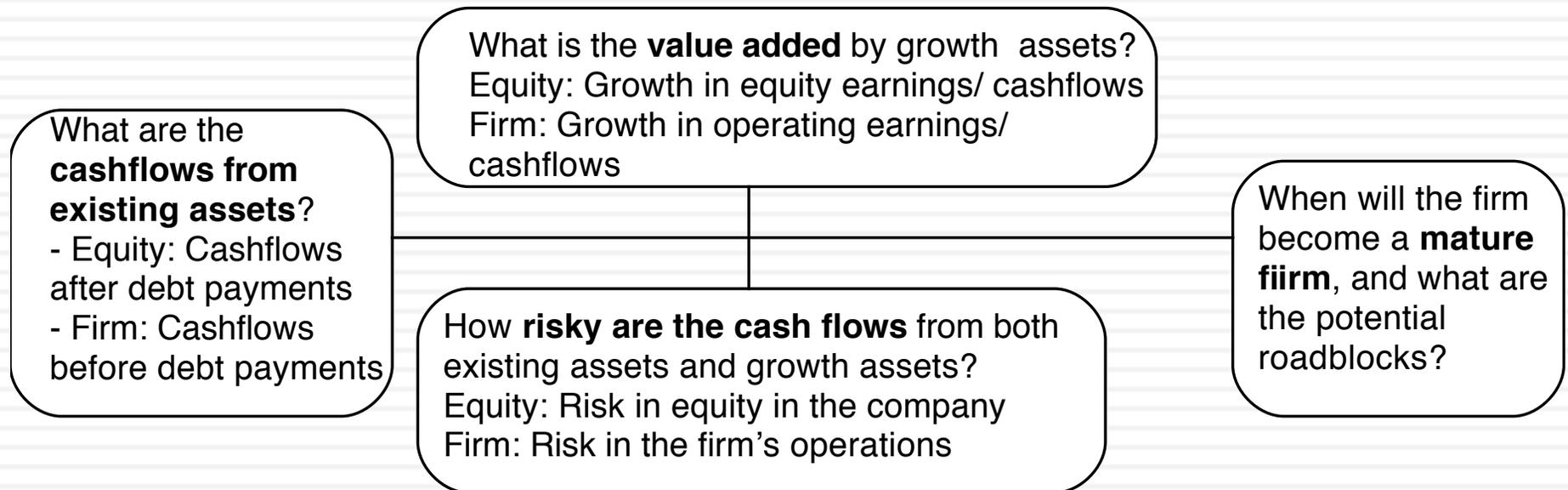
For cash flow generating assets, the intrinsic value will be a function of the magnitude of the expected cash flows on the asset over its lifetime and the uncertainty about receiving those cash flows.

$$\text{Value of asset} = \frac{E(\text{CF}_1)}{(1+r)} + \frac{E(\text{CF}_2)}{(1+r)^2} + \frac{E(\text{CF}_3)}{(1+r)^3} \dots + \frac{E(\text{CF}_n)}{(1+r)^n}$$

- 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 determinants of value

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DCF as a tool for intrinsic valuation

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

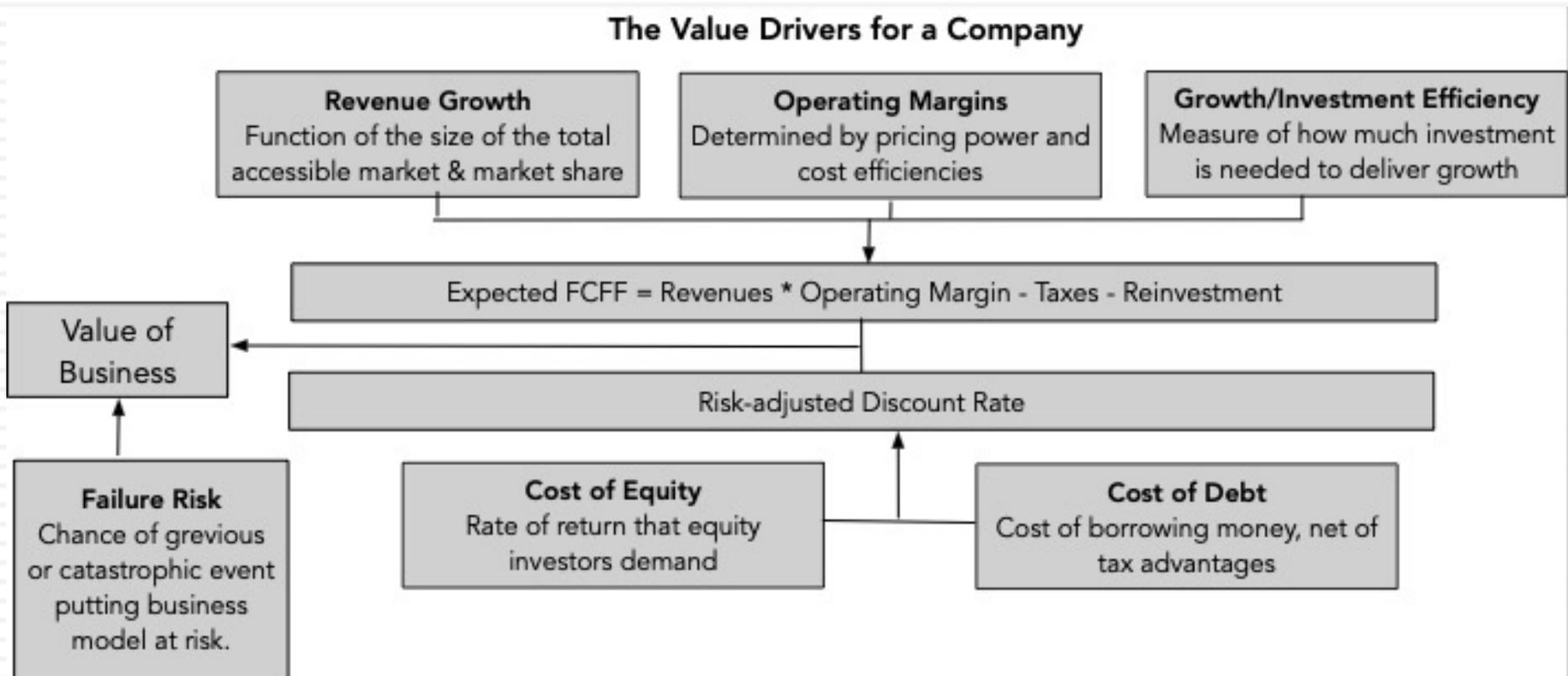
Cash flows from existing assets
The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

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

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

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

Value: The Drivers





Pricing
It's demand and supply

The determinants of price

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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

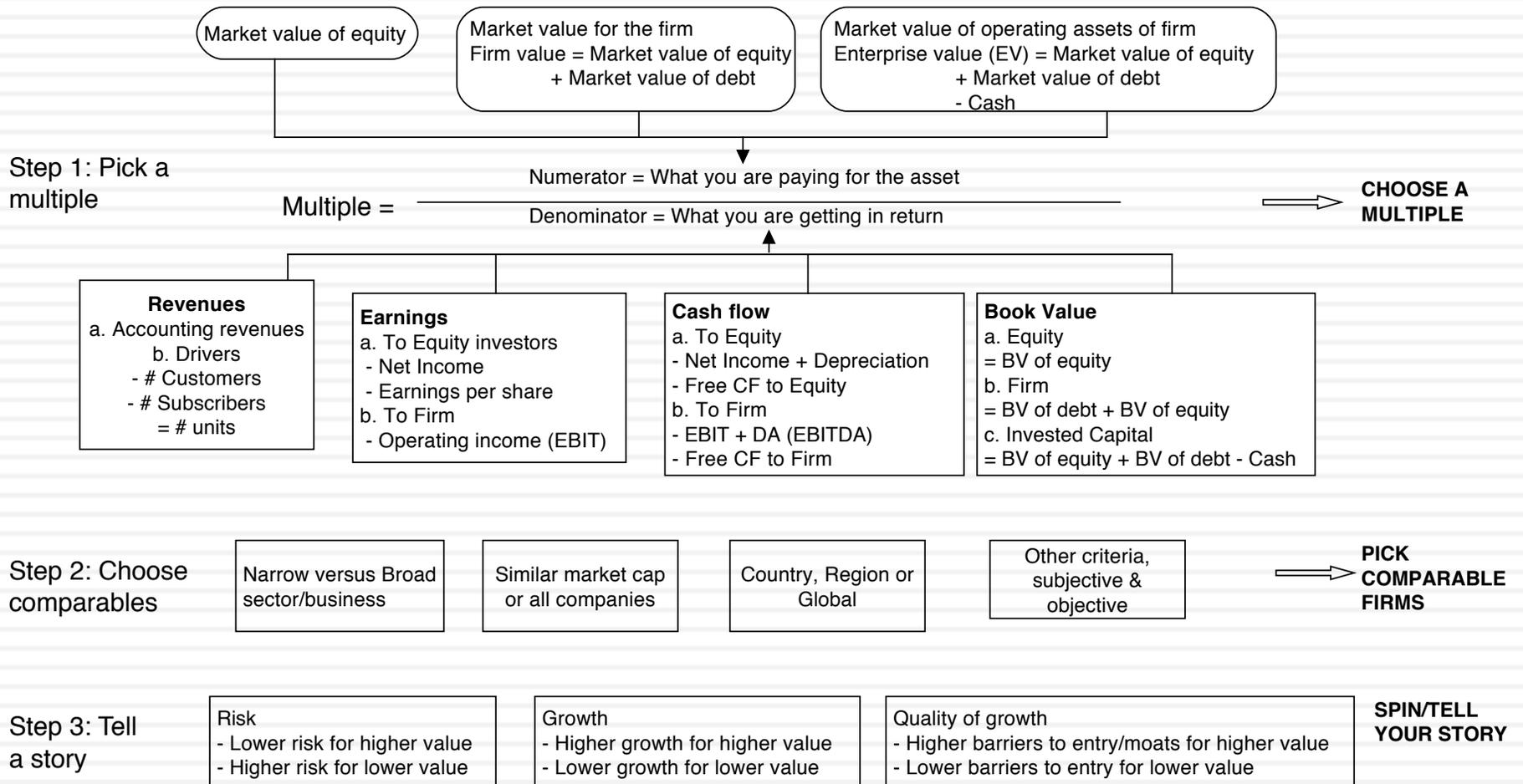
To the extent that pricing is about gauging what other investors will do, the price can be determined by the "herd".

Tools for Pricing: Technical Analysis & Charting

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A more general tool: Multiples and Comparable Transactions



To be a better pricer, here are four suggestions

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

1. Check the Multiple

- Is the multiple consistently defined?
 - The consistency principle: Both the value (the numerator) and the standardizing variable (the denominator) should be to the same claimholders in the firm. In other words, the value of equity should be divided by equity earnings or equity book value, and firm value should be divided by firm earnings or book value.
 - The cost of mismatching: Assets that are not cheap (expensive) will look cheap (expensive), because your mismatch will skew the numbers.
- Is the multiple uniformly estimated?
 - The uniformity rule: The variables used in defining the multiple should be estimated uniformly across assets in the “comparable firm” list.
 - The cost of ignoring this rule: You will be comparing non-comparable numbers and drawing all the wrong conclusions.

2. Play Moneyball: Let the numbers talk (not the analysts)

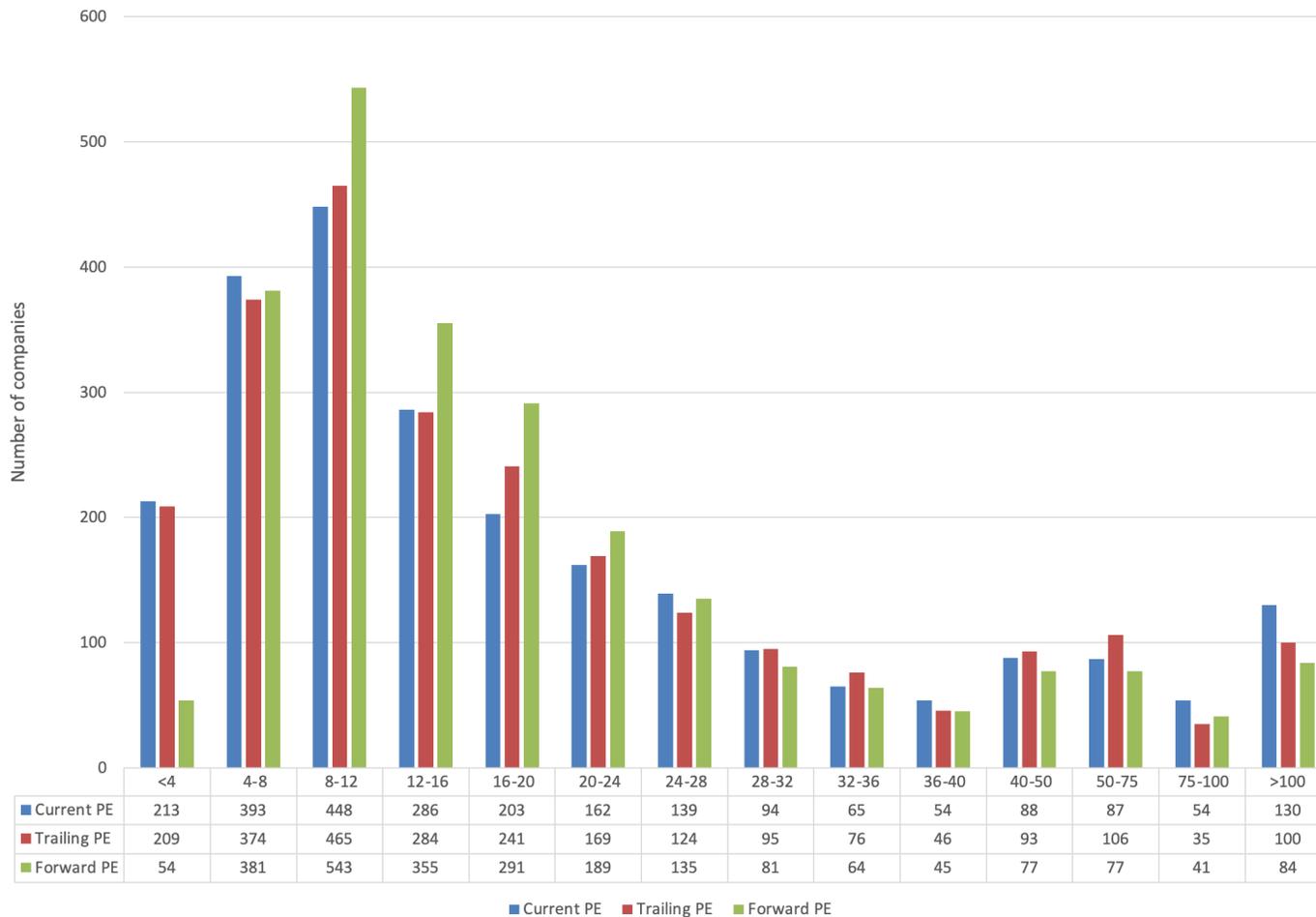
- What is the average and standard deviation for this multiple, across the universe (market)?
- What is the median for this multiple?
 - The median for this multiple is often a more reliable comparison point.
- How large are the outliers to the distribution, and how do we deal with the outliers?
 - Throwing out the outliers may seem like an obvious solution, but if the outliers all lie on one side of the distribution (they usually are large positive numbers), this can lead to a biased estimate.
- Are there cases where the multiple cannot be estimated? Will ignoring these cases lead to a biased estimate of the multiple?
- How has this multiple changed over time?

1. Multiples have skewed distributions...

US company PE Ratios

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Current, Trailing and Forward PE Ratios: US Stocks in January 2023



2. Making statistics “dicey”

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	Current PE	Trailing PE	Forward PE
Number of firms	7165	7165	7165
Number with PE	3,099	3,097	2,417
Average	109.25	82.09	30.70
Median	13.92	14.50	14.44
Minimum	0.05	0.04	0.05
Maximum	86400.00	21678.00	4896.00
Standard deviation	1698.48	805.04	125.4
Standard error	34.1	14.47	2.55
Skewness	37.69	21.28	26.78
25th percentile	7.91	8.28	9.19
75th percentile	29.4	28.65	23.97

US firms in January 2023

3. Understand your “implicit” assumptions

- What are the fundamentals that determine and drive these multiples?
 - Proposition 1: Embedded in every multiple are all of the variables that drive every discounted cash flow valuation - growth, risk and cash flow patterns.
 - In fact, using a simple discounted cash flow model and basic algebra should yield the fundamentals that drive a multiple
- How do changes in these fundamentals change the multiple?
 - The relationship between a fundamental (like growth) and a multiple (such as PE) is seldom linear. For example, if firm A has twice the growth rate of firm B, it will generally not trade at twice its PE ratio
 - Proposition 2: It is impossible to properly compare firms on a multiple, if we do not know the nature of the relationship between fundamentals and the multiple.

A Simple Analytical device

Start with a basic intrinsic value model

Divide both sides of the equation by the denominator of the multiple that you are trying to deconstruct..

You should end up with an intrinsic version of your multiple, which should relate it to fundamentals.

If Equity Multiple

Start with a dividend or FCFE model, preferably simple.

$$\text{Price} = \text{EPS} * \text{Payout} / (r - g)$$

Divide your dividend or FCFE model by denominator of equity multiple.

$$\text{Price/Book} = \text{ROE} * \text{Payout} / (r - g)$$

Intrinsic version of equity multiple, with drivers of value

$$\text{Price/Book} = f(\text{ROE}, r, g, \text{Payout})$$

If EV Multiple

Start with a operating asset value model, preferably simple.

$$\text{EV} = \text{EBIT} (1-t) (1- RIR) / (\text{WACC} - g)$$

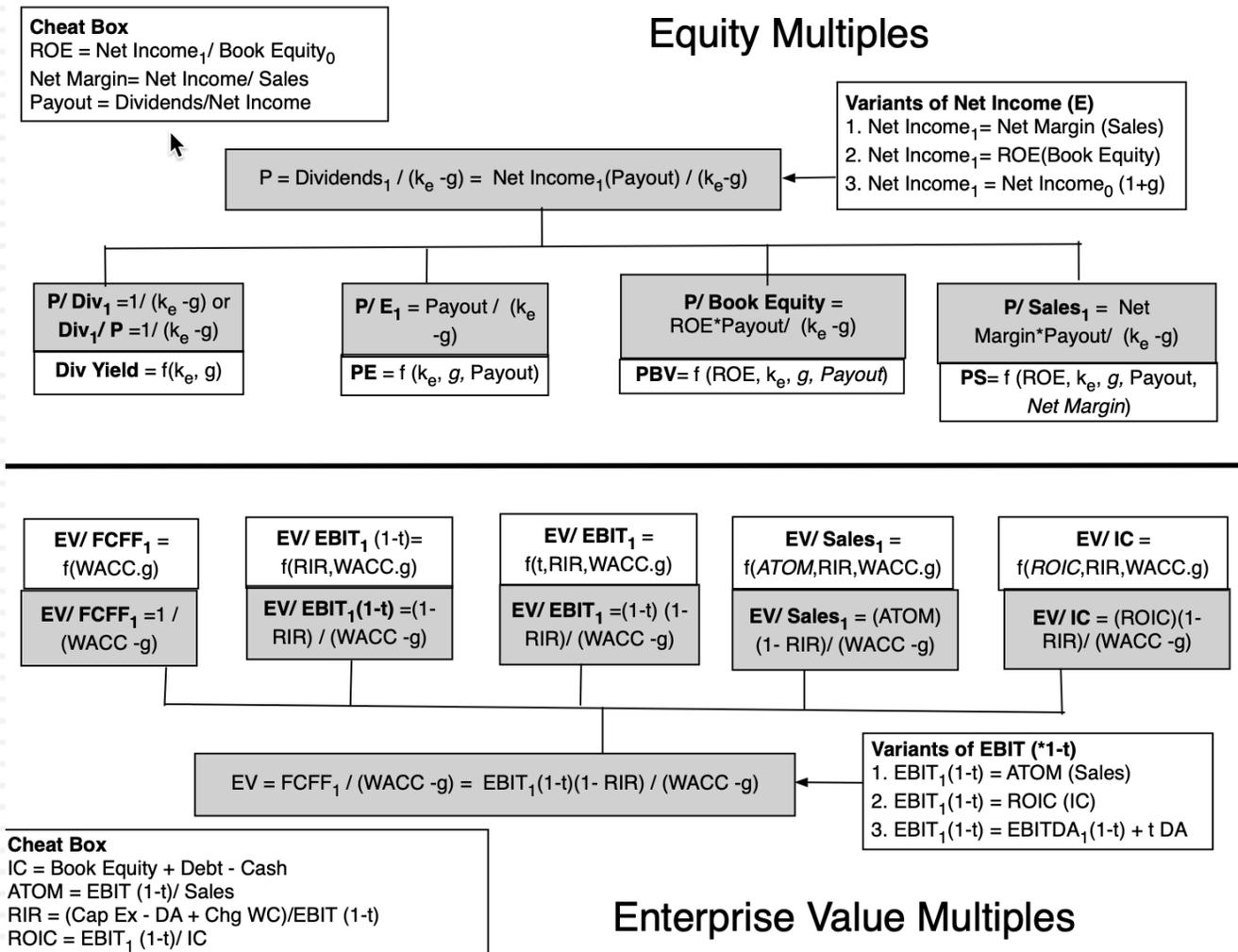
Divide your operating asset model by denominator of EV multiple.

$$\text{EV/Sales} = \text{After-tax Operating Margin} (1- RIR) / (\text{WACC} - g)$$

Intrinsic version of EV multiple, with drivers of value

$$\text{EV/Sales} = f(\text{After-tax Operating Margin}, RIR, \text{WACC}, g)$$

The Determinants of Multiples...



4. Define “comparable” broadly & control for differences

- Given the firm that we are valuing, what is a “comparable” firm?
 - ▣ While traditional analysis is built on the premise that firms in the same sector are comparable firms, valuation theory would suggest that a comparable firm is one which is similar to the one being analyzed in terms of fundamentals.
 - ▣ Proposition 4: There is no reason why a firm cannot be compared with another firm in a very different business, if the two firms have the same risk, growth and cash flow characteristics.
- Given the comparable firms, how do we adjust for differences across firms on the fundamentals?
 - ▣ Proposition 5: It is impossible to find an exactly identical firm to the one you are valuing.

Rules for the road: Pricing

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1. Respect the market: As a trader, you are not only at the mercy of the market, but you are assuming that over time, the market gets it right.
2. Watch for momentum shifts: It is easy to be a winner when the momentum is on your side, but you can lose it all if you don't detect momentum shifts.
3. Act decisively and quickly: Hamlet would not have been a good trader.
4. Rest your ego: If you believe that you are bigger than the market, you will over reach and destroy yourself.
5. Don't intellectualize: Trading is a simple exercise of gauging what the market thinks a stock or asset is worth, not an assessment of fundamentals.



**PRICE OR VALUE?
PICK YOUR POISON!**

What's your game?

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- The transactors
 - ▣ Traders: Oscar Wilde's definition of a cynic: "knows the price of everything, the value of nothing".
 - ▣ Salespeople: Caveat emptor!
 - ▣ Deal intermediaries: Get the deal done (even if it is not a good deal)!
- The muddled middle
 - ▣ Academic value: The cognitive dissonance of the "efficient market"
 - ▣ Accounting value: Rule maker, rule maker, make up your mind!
 - ▣ Legal value: The bane of the expert witness!
- The investors
 - ▣ Owners of businesses: Except if you want to run it for the long term.
 - ▣ Investors in companies: With faith and patience, you can take advantage of Mr. Market.
 - ▣ Long term consultants: You have to live with the consequences of the advice that you mete out to your clients.

The Value versus Price Debate

	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 value 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 value	Can be priced against other currencies, with greater acceptance & more stable purchasing power = higher price.
Collectible	Cannot be value	Can be priced based upon scarcity and desirability.

In the muddled middle, what you get is neither price nor value, but mush..

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- The “fair value accounting” oxymoron: Fair value accounting requires accountants to value assets based upon what “market participants” will pay for those assets in arms length transactions today.
- Legal Valuation: In courts, experts witnesses are generally asked to opine on the values of assets, often in the abstract. It is unclear whether they are being asked to price assets or value assets, and that allows them to stake extreme positions (depending on which side is paying them).
- Academic valuation: Much of what passes for valuation in financial theory is just pricing.

In the investing world, there are three views of “the gap”

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	View of the gap	Investment Strategies
The Efficient Marketer	The gaps between price and value, if they do occur, are random.	Index funds
The “value” extremist	You view pricers as dilettantes who will move on to fad and fad. Eventually, the price will converge on value.	Buy and hold stocks where value > price
The pricing extremist	Value is only in the heads of the “eggheads”. Even if it exists (and it is questionable), price may never converge on value.	(1) Look for mispriced securities. (2) Get ahead of shifts in demand/momentum.

The pricer's dilemma..

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- No anchor: If you do not believe in intrinsic value and make no attempt to estimate it, you have no moorings when you invest. You will therefore be pushed back and forth as the price moves from high to low. In other words, everything becomes relative and you can lose perspective.
- Reactive: Without a core measure of value, your investment strategy will often be reactive rather than proactive.
- Crowds are fickle and tough to get a read on: The key to being successful as a pricer is to be able to read the crowd mood and to detect shifts in that mood early in the process. By their nature, crowds are tough to read and almost impossible to model systematically.

The valuer's dilemma

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- Uncertainty about the magnitude of the gap:
 - Margin of safety: Many value investors swear by the notion of the “margin of safety” as protection against risk/uncertainty.
 - Collect more information: Collecting more information about the company is viewed as one way to make your investment less risky.
 - Ask what if questions: Doing scenario analysis or what if analysis gives you a sense of whether you should invest.
 - Confront uncertainty: Face up to the uncertainty, bring it into the analysis and deal with the consequences.
- Uncertainty about gap closing: This is tougher and you can reduce your exposure to it by
 - Lengthening your time horizon
 - Providing or looking for a catalyst that will cause the gap to close.

The choice is yours (and there is no right one)

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1. Do your job: There is no right or wrong way to put a number on an asset. If your job is to price it, that is exactly what you should do. If it is to value it, go for an intrinsic value approach.
2. Don't be delusional: If you are pricing an asset, don't get distracted too much by fundamentals and intrinsic value concerns. If you are valuing an asset, don't let the pricing process (mood & momentum) feed back into your valuation.
3. Play to your strengths: To be a successful investor, you have to know what makes you tick and pick the approach that best fits you.