

Bootcamp Week 5



2/28/22

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Why Learn Valuation Methods?

- When valuing a company, there are three main valuation methods used by industry practitioners
- These common methods of valuation are utilized across the finance industry, including investment banking, equity research, private equity, etc.

Valuation Methods

- 1) Comparable Company Analysis
- 2) Precedent Transaction Analysis
- 3) Discounted Cash Flow (DCF)
- 4) * Leveraged Buyout (LBO)

Selecting Comps

The 3 main ways to select companies and transactions:

1. Industry classification
2. Financial criteria (Revenue, EBITDA, etc.)
3. Geography

For Precedent Transactions, you often limit the set based on date and only look at transactions within the past 1-2 years. The most important factor is industry – that is always used to screen for companies/transactions, and the rest may or may not be used depending on how specific you want to be

Comparable Company Analysis

- Uses metrics from public companies that are similar to the company being analyzed to estimate a value for the target
- Steps
 - Determine a set of comps (based on size, region, industry, etc.)
 - Locate necessary information to calculate metrics
 - Calculate metrics (ratios/multiples/etc.)
 - EV/EBITDA → unaffected by cap structure, unaffected by different depreciation policies
 - EV/Sales → value companies w/ negative earnings, but valued regardless of profitability
 - EV/EBITDAR (for consumer retail)
 - Price/Earnings (stock price / EPS)
 - Where EPS is net income / # shares outstanding
 - Determine best comp and where target company fits within set of multiples
 - Estimate target's value given its position in the peer set by multiplying average by the chosen KPI
- Ex: Digital media companies with over \$100 million in revenue

Comparable Company Analysis

- Evaluates the value of a company using the metrics of other similar public companies
- Pro:
 - Based on current market conditions, quick, convenient and relative
- Cons:
 - Market-based means that valuation can be impacted by emotion, doesn't account for intricacies which may not be relevant to the comps
- When to use: There is a clear public comp peerset that is relevant to your company

Company Name	Market Data			Financial Data				Valuation			
	Price (\$/share)	Market Cap (\$M)	TEV (\$M)	Sales (\$M)	EBITDA (\$M)	EBIT (\$M)	Earnings (\$M)	EV/Sales x	EV/EBITDA x	EV/EBIT x	P/E x
The Coca-Cola Company	38.14	168,041	185,122	46,854	13,104	11,127	7,381	4.0x	14.1x	16.6x	22.8x
Pepsico, Inc.	81.37	123,883	143,824	66,415	12,344	9,878	5,618	2.2x	11.7x	14.6x	22.1x
Dr Pepper Snapple Group, Inc.	52.31	10,326	12,764	5,997	1,319	1,103	620	2.1x	9.7x	11.6x	16.7x
Monster Beverage Corporation	69.62	11,618	11,004	2,246	606	584	357	4.9x	18.1x	18.9x	32.5x
National Beverage Corp.	20.81	964	968	645	78	66	41	1.5x	12.5x	14.6x	23.5x
Average								2.9x	13.2x	15.3x	23.5x
Median								2.2x	12.5x	14.6x	22.8x

Precedent Transaction Analysis

- Based on the idea that a company's worth can be determined by looking at the prices paid for similar companies in similar situations in the past
- Pro:
 - Helps provide a general assessment of the market's demand for a particular asset and an approximate valuation of the asset, based on public information, provides index of premiums paid by buyers and accepted by sellers
- Con:
 - Hard to apply market conditions at the time of a previous valuation or during a certain performance period to a current valuation, the fact that a particular multiple was paid in the past does not necessarily mean it still applies today

Precedent Transaction Analysis Cont.

- Uses recent past deals to value a company - looks at transaction price rather than market price
- Tends to lead to the highest valuation due to the **control premium** - additional premium that comes with purchasing a business for control
- The steps for Precedent Transactions are pretty much the same as the steps for a comparable companies analysis, but now you are looking for deals and acquisitions and not just company info and are potentially using a different set of multiples.
- Ex: Airline M&A transactions over the past 2 years involving sellers with over \$1 billion in revenue, Retail M&A transactions over the past year

Date	Target	Transaction Value (\$M)	Buyers	Valuation		
				EV/Sales	EV/EBITDA	EV/EBIT
01/24/2017	Current Ltd	2,350	Average Limited	1.9x	9.4x	11.2x
04/19/2016	Recent Inc	6,500	Bohemeth Industires	1.4x	8.0x	12.6x
04/19/2014	Past Co	2,150	Other Group	1.3x	8.7x	12.1x
11/07/2014	Historical LLP	450	Junior Enterprises	2.3x	11.1x	13.6x
11/01/2012	Old Group	325	Minature Company	5.1x	18.8x	21.5x
10/07/2011	Dated Enterprises	150	Micro Partners	2.1x	9.3x	13.2x
Average				2.3x	10.9x	14.0x
Median				2.0x	9.4x	12.9x

How to Apply Valuation

Sometimes this simple fact gets lost in discussion of valuation methodologies. You take the median/average multiple of a set of companies or transactions, and then multiply it by the relevant metric from the company you're valuing.

Example: If the median EV/EBITDA multiple from your set of Precedent Transactions is 8x and your company's EBITDA is \$500 million, the implied EV would be \$4 billion.

Common Multiples Used in Valuation

A Overview of Most Common Multiples

	FORMULA	COMMENTS
SALES MULTIPLE	$\frac{EV}{Sales}$	<ul style="list-style-type: none"> A crude measure but the least distorted by accounting differences Values revenues regardless of profitability Differentiate between trade sales and sales of own production Facilitates cross-border comparison Enables to value companies with negative earnings
EBITDA MULTIPLE	$\frac{EV}{EBITDA}$	<ul style="list-style-type: none"> Values operating and “cash” generating capacity of a company Unaffected by capital structure, interest and tax rates Useful multiple as it is unaffected by different depreciation and amortization policies Do not use to compare companies with differing capital intensity Most common multiple to value assets in Chemicals industry
EBIT MULTIPLE	$\frac{EV}{EBIT}$	<ul style="list-style-type: none"> Values fundamental operating performance Unaffected by capital structure, interest and tax rates Unaffected by non-operating items (e.g., licenses) Takes capital intensity into account (via depreciation) Affected by accounting policy differences for depreciation and amortization

Common Multiples Used in Valuation

A Overview of Most Common Multiples (cont'd)

	FORMULA	COMMENTS
EBITDA - CAPEX MULTIPLE	$\frac{EV}{EBITDA - CAPEX}$	<ul style="list-style-type: none"> + Values operating and “cash” generating capacity of a company + Unaffected by capital structure, interest and tax rates + Useful multiple as it is unaffected by different depreciation and amortization policies + Useful multiple to compare companies with different capital intensity and Capex requirements
NET INCOME OR P/E MULTIPLE (“KGV” in German)	$\frac{EqV}{Net\ income}$	<ul style="list-style-type: none"> + Simple and universal measure used by equity investors to determine value and relative value of companies + P/E measures value that is directly attributable to shareholders - Sensitive to capital structure - Subject to accounting differences - Sensitive to effective corporate taxation rate

$$\frac{\text{Market value (EV or EqV) company 1}}{\text{KPI company 1}} \times \text{KPI asset in question} = \text{Value asset in question}$$

Company Name	Market Data			Financial Data				Valuation			
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Discounted Cash Flow Analysis (DCF)

- An **intrinsic** valuation method
- You predict out cash flow 5-7 years and use a discount rate to discount those cash flows to present value taking into account the time value of money
- A DCF values a company based on the Present Value of its unlevered free Cash Flows and the Present Value of its Terminal Value, both discounted at the Weighted Average Cost of Capital (or WACC)
 - Unlevered free cash flows = cash flows generated by the company before financing costs, such as the payment of interest to debt holders or the payment of dividends to equity holders
 - You use unlevered free cash flows because the capital structure of a company could change

Discounted Cash Flow Analysis

- A DCF measures the intrinsic value of a company by projecting its current and future cash flows
- If someone asks “walk me through a DCF”, this is what you actually say:

“A DCF is an intrinsic method of valuing a company where you forecast a company’s cash flows out, say, 10 years and then discount each of those years back to a present value. You do this because of the time value of money, meaning that a dollar today is worth more than a dollar in the future (mostly because of inflation), and is similar to an opportunity cost in economics. In terms of strengths, being intrinsic means it isn’t dependent on other companies or extraneous market forces. However, not factoring in the market or industry position can be a con as well as the fact that it’s sensitive to assumptions.”

****** If you say this, you better be able to say what inflation is, what an opportunity cost is, and dive deeper into “market forces” or what you mean by “assumptions”

Pros/Cons & When to Use DCF

- Pro:
 - Not dependent on other companies/transactions (intrinsic), less influenced by external factors, incorporates expected operating strategy, recognizes the time value of money
- Con:
 - Very sensitive to assumptions, does not factor in the market
- When to use:
 - When growth of a company is predictable, no available comps, want a company's own value without influence of others, or as a market check
- When to NOT use:
 - If the company has unstable or unpredictable cash flows (tech or biotech startup)

Discounted Cash Flow Analysis: Detailed

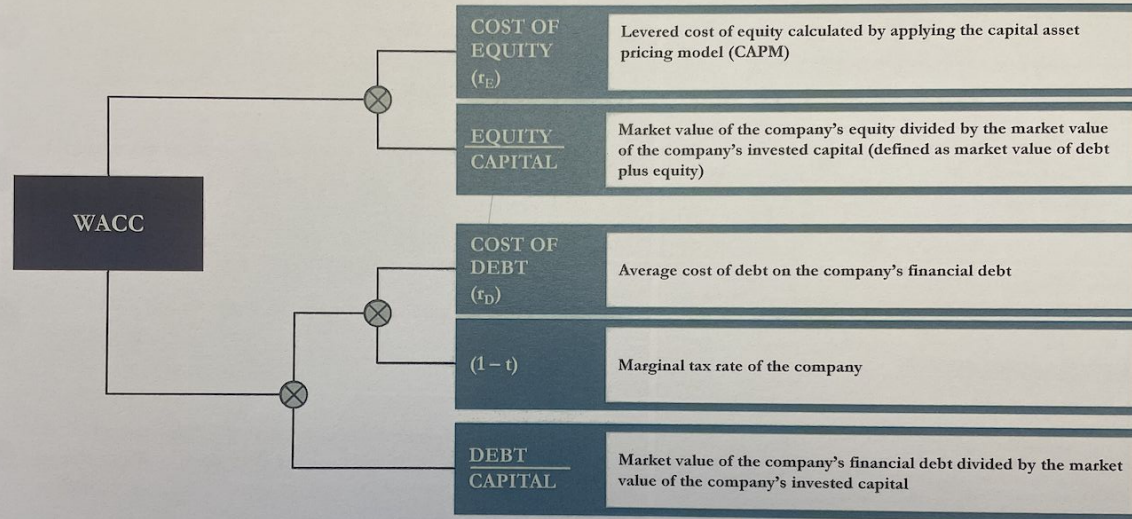
- Steps
 - **Select appropriate forecast period** - considering when firm will reach steady state condition (typically 5-10 years)
 - **Project unlevered free cash flows** for each year in the forecast period (EBITDA → EBIT → tax-affected EBIT → cash flow adjusted EBIT)
 - **Calculate the WACC** (using company's cost of debt, cost of equity, and utilizing an estimation model such as CAPM)
 - **Discount unlevered free cash flows** by the WACC to determine present value - add them up
 - **Calculate terminal value** to capture value of its cash flows beyond forecast period (use Exit Multiple Method, Perpetuity Growth Rate Method, or both), then discount terminal value using WACC
 - **Derive Enterprise Value** (present value terminal value + net present value of free cash flows)
 - **Derive Equity Value** from Enterprise Value by subtracting debt, noncontrolling interest, etc. and adding cash & equivalents.
 - **Calculate equity value per share** using Treasury Stock Method
- Always run sensitivities and create a defensive range of values!

Calculating WACC

- WACC (Weighted Average Cost of Capital) represents the blended cost to both the debt and equity holders, based on the cost of debt and equity to that firm
- The formula is: **Cost of Equity * (% Equity) + Cost of Debt * (% Debt) * (1 – Tax Rate)**
 - $(\% \text{ Equity}) = E/(D+E)$
 - Make sure to remember to take the tax rate from the debt
 - Interest is tax deductible – your debt gets a tax shield
- In all cases, the percentages refer to how much of the company's capital structure is taken up by each component.
- The cost of debt and the cost of equity are the rates of return required by debt and equity providers
 - The cost of debt is just the company's cost to borrow new long-term debt in the current market environment (so the current interest rates)
- As the WACC decreases, the value of the company increases and vice versa.

How to Calculate WACC

② Calculation of the Weighted Average Cost of Capital (WACC)



$$\text{WACC} = \underbrace{\left[r_E \times \frac{\text{Equity}}{\text{Capital}} \right]}_{\text{Weighted Cost of Equity}} + \underbrace{\left[r_D \times (1 - t) \times \frac{\text{Debt}}{\text{Capital}} \right]}_{\text{Weighted post-tax Cost of Debt}}$$

Cost of Equity (CAPM)

- **CAPM: Capital Asset Pricing Model**
- **Cost of Equity = Risk-Free Rate + Beta * Equity Risk Premium**
- The cost of equity is used to reward your equity investors with some premium over the riskless investment
- **The risk-free rate** represents how much a 10-year or 20-year US Treasury should yield
- **Beta** = company's beta, measure of the stock's volatility in relation to the stock market, calculated based on the "riskiness" of comparable companies (if it is 1, the company moves with the same relative changes as the market)
 - A beta of less than 1, like .5 means that the investment is half as volatile as the market.
- **Equity Risk Premium** is the % by which stocks are expected to outperform "riskless" assets.
 - Normally you pull the Equity Risk Premium from a publication called Ibbotson's.
- Note: This formula does not tell the whole story. Depending on the bank and how precise you want to be, you could also add in a "size premium" and "industry premium" to account for how much a company is expected to outperform its peers is according to its market cap or industry.
- Small company stocks are expected to outperform large company stocks and certain industries are expected to outperform others, and these premiums reflect these expectations.

Beta

- To get beta, you can just look up the Beta for each comparable company usually on Bloomberg, un-lever each one, take the median of the set and then lever it based on your company's capital structure
- Then you use this levered Beta in the cost of equity equation
- The Beta's you look up on Bloomberg are already levered to reflect the debt assumed by each company
- But each company's capital structure is different and we want to look at how "risky" a company is regardless of what percentage debt or equity it has
- So we individually have to un-lever each beta, but then after we find the median beta and re-lever it because we want to the beta in our Cost of Equity equation to reflect the true risk of our company, taking into account its capital structure this time
- **Un-levered beta = levered beta / (1 + (1-tax rate) x (total debt/total equity))**
- **Levered beta = unlevered beta x (1 + (1-tax rate) x (total debt/total equity))**

How to Calculate Cost of Equity (CAPM Model)

$$R_i = R_f + \beta_i \times (R_m - R_f)$$

- R_i is the expected return on the investment;
- R_f is the risk-free rate;
- β_i is the beta of the investment;
- R_m is the expected return of the market.

How to Calculate Terminal Value (TV)

Terminal Value #1 (Perpetual Growth Method)

$$TV = \frac{[FCF_n \times (1 + g)]}{(WACC - g)}$$

Terminal Value #2 (Exit Multiple Method)

$$TV = \text{Financial Metric} \times \text{Trading Multiple}$$

(i.e. EBITDA x 10.0)

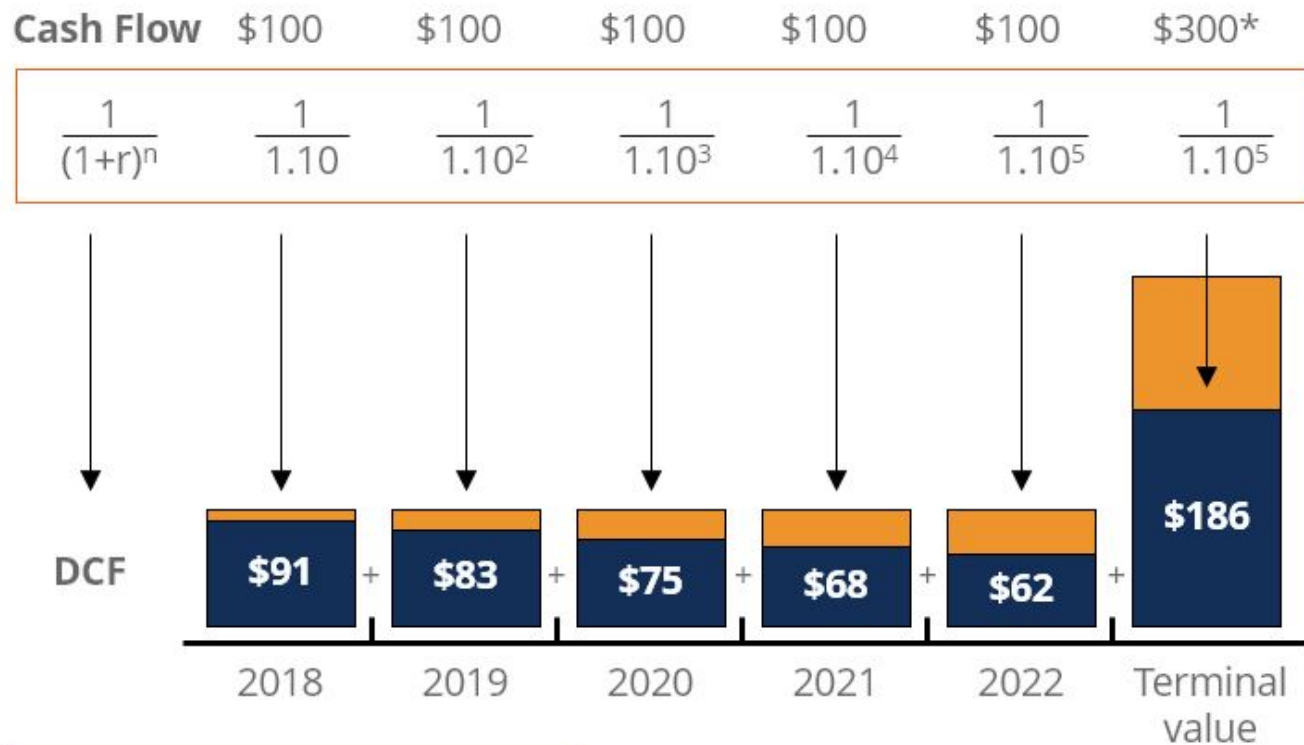
Terminal Value: Perpetuity Growth Rate Method

- Perpetuity growth rate method
 - This method uses the perpetuity formula to value the company as of the terminal date, based on the assumption that the company will operate forever
 - Assume a growing perpetuity and a low perpetuity growth rate (1 to 3 percent annually for example)
 - **$TV = CF_n (1 + g) / WACC - g$**
 - g = long term growth rate
 - CF_n = the final cash flow

Terminal Value: Multiple Method

- Multiple method
 - Uses a comparable company or comparable transaction method of analysis to estimate the terminal value
 - A valuation multiple is applied to the company's financial data in the last year of the projection period such as the EV/EBITDA multiple
 - Using a comparable **trading** multiple if the assumption is that the company will not be sold after the projection period
 - Use a comparable **transaction** multiple if the assumption is that the company will be sold after the projection period

Discounted Cash Flow Formula



DCF Value = \$565 million

* Value of FCF beyond 2022

Discounted Cash Flow Valuation	Projected					
	2010E	2011E	2012E	2013E	2014E	2015E
Calendar Years ending December 31,						
(\$ in thousands)						
EBITDA	\$8,954	\$9,898	\$10,941	\$12,093	\$13,367	\$13,367
Less D&A	1,112	1,222	1,343	1,476	1,623	1,623
EBIT	7,842	8,676	9,598	10,617	11,745	11,745
Less: Cash Taxes (35%)	(2,745)	(3,037)	(3,359)	(3,716)	(4,111)	(4,111)
Tax-adjusted EBIT	5,097	5,639	6,239	6,901	7,634	7,634
Plus: D&A	1,112	1,222	1,343	1,476	1,623	1,623
Less: Capital Expenditures	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)
Less: Change in Net Working Investment	(318)	(350)	(384)	(423)	(465)	(465)
Unlevered Free Cash Flow	\$4,141	\$4,762	\$5,447	\$6,205	\$7,042	\$7,042
Perpetuity Growth Rate Approach						
Discount Rate	11.0%			12.0%		
Perpetuity Growth	1.0%	2.0%	3.0%	1.0%	2.0%	3.0%
2015 Unlevered FCF	\$7,042	\$7,042	\$7,042	\$7,042	\$7,042	\$7,042
Terminal Value	\$71,124	\$79,809	\$90,665	\$64,658	\$71,828	\$80,591
PV of Terminal Value	\$42,209	\$47,363	\$53,805	\$36,689	\$40,757	\$45,730
PV of Free Cash Flows ('10 - '14)	\$23,610	\$23,610	\$23,610	\$22,877	\$22,877	\$22,877
Implied Enterprise Value	\$65,818	\$70,972	\$77,415	\$59,566	\$63,635	\$68,607
Less: Net Debt	\$10,750	\$10,750	\$10,750	\$10,750	\$10,750	\$10,750
Implied Value of Equity	\$76,568	\$81,722	\$88,165	\$70,316	\$74,385	\$79,357
EBITDA Multiple Approach						
Discount Rate	11.0%			12.0%		
Terminal EBITDA Multiple	6.0x	7.0x	8.0x	6.0x	7.0x	8.0x
2015 EBITDA	\$13,367	\$13,367	\$13,367	\$13,367	\$13,367	\$13,367
Terminal Value	\$80,203	\$93,571	\$106,938	\$80,203	\$93,571	\$106,938
PV of Terminal Value	\$47,597	\$55,530	\$63,462	\$45,510	\$53,094	\$60,679
PV of Free Cash Flows ('10 - '14)	\$23,610	\$23,610	\$23,610	\$22,877	\$22,877	\$22,877
Implied Enterprise Value	\$71,207	\$79,139	\$87,072	\$68,387	\$75,972	\$83,557
Less: Net Debt	\$10,750	\$10,750	\$10,750	\$10,750	\$10,750	\$10,750
Implied Value of Equity	\$81,957	\$89,889	\$97,822	\$79,137	\$86,722	\$94,307

Source: Company Website, Management, and financial projections.

Leveraged Buyout (LBO)

- Fancy term for using lots of debt to buy a company
- Have you heard of real estate flipping? Private equity (sponsor) firms do the same thing, but instead they flip companies.

Essentially an LBO is using lots of debt, and a little bit of cash, to buy a company. Hopefully you can buy that company at a discount, use the cash flows from operating that company to pay down the debt, and then sell it at a profit 5 -7 years in the future. Internal rate of return (IRR) is an important metric.

- A good LBO candidate is currently undervalued, has a clear exit strategy, low capex requirements, clean balance sheet with little pre existing debt, ability to cut costs, strong competitive advantage and market position

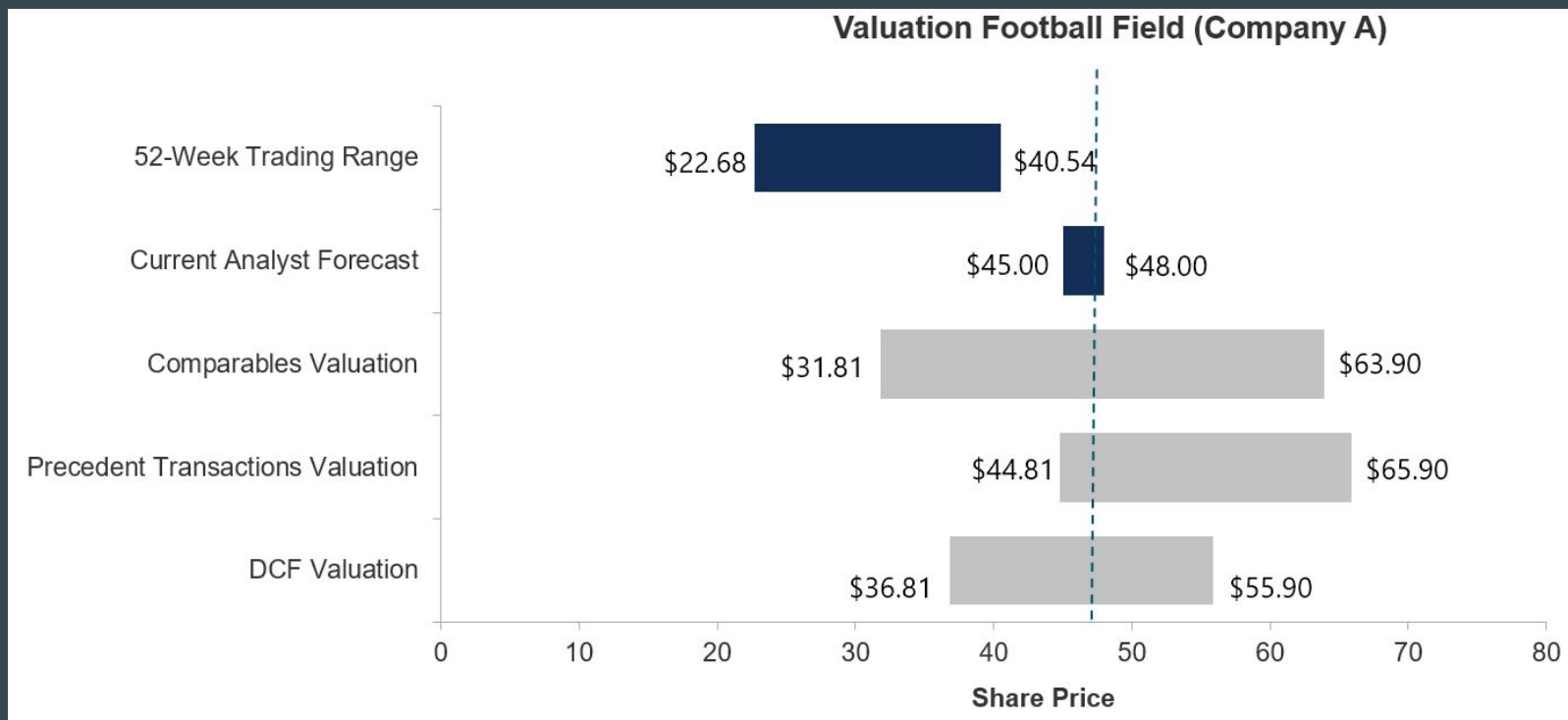
Ranking the Valuation Methods

From highest to lowest valuation...

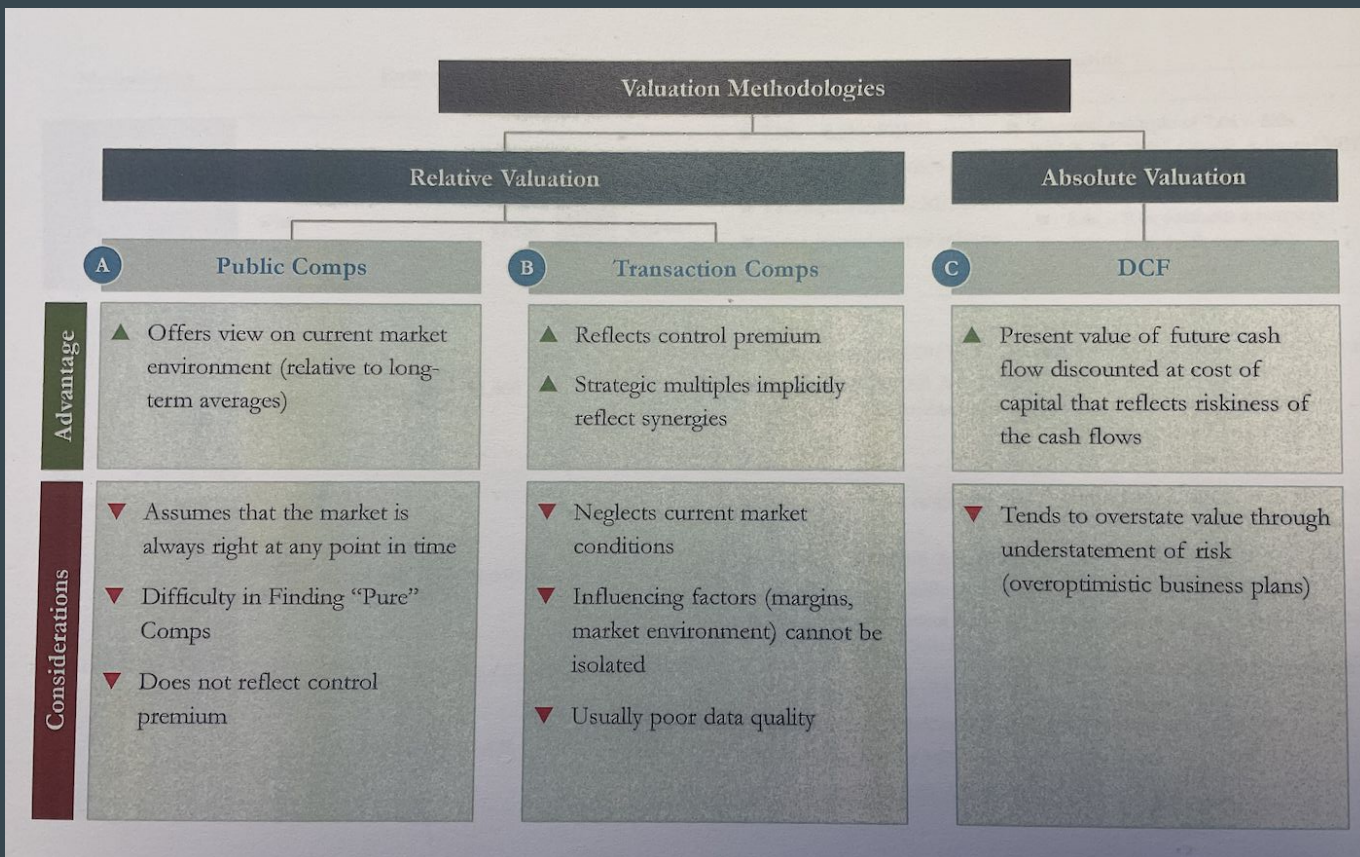
1. Precedent Transaction
2. DCF
3. Public Comps
4. LBO

Reasoning: PT's include a control premium which is the extra \$ you pay in addition to the value of the company to buy it. DCF's tend to have a lot of growth assumptions. LBO's are going to be low because sponsors don't want to pay a lot of companies, so they will obviously try to undervalue it.

How to Apply Valuation - Football Field



Valuation Summary



Questions?