# Technical Prep: Valuation

•••

1/23/2023

# IBD Technicals

| ACCOUNTING | VALUATION | MERGER MODELS, PAPER LBOs |
| --- | --- | --- |

| PRECEDENT TRANSACTIONS, COMPARABLE COMPANIES, LBOS | DCF | MULTIPLES |
| --- | --- | --- |
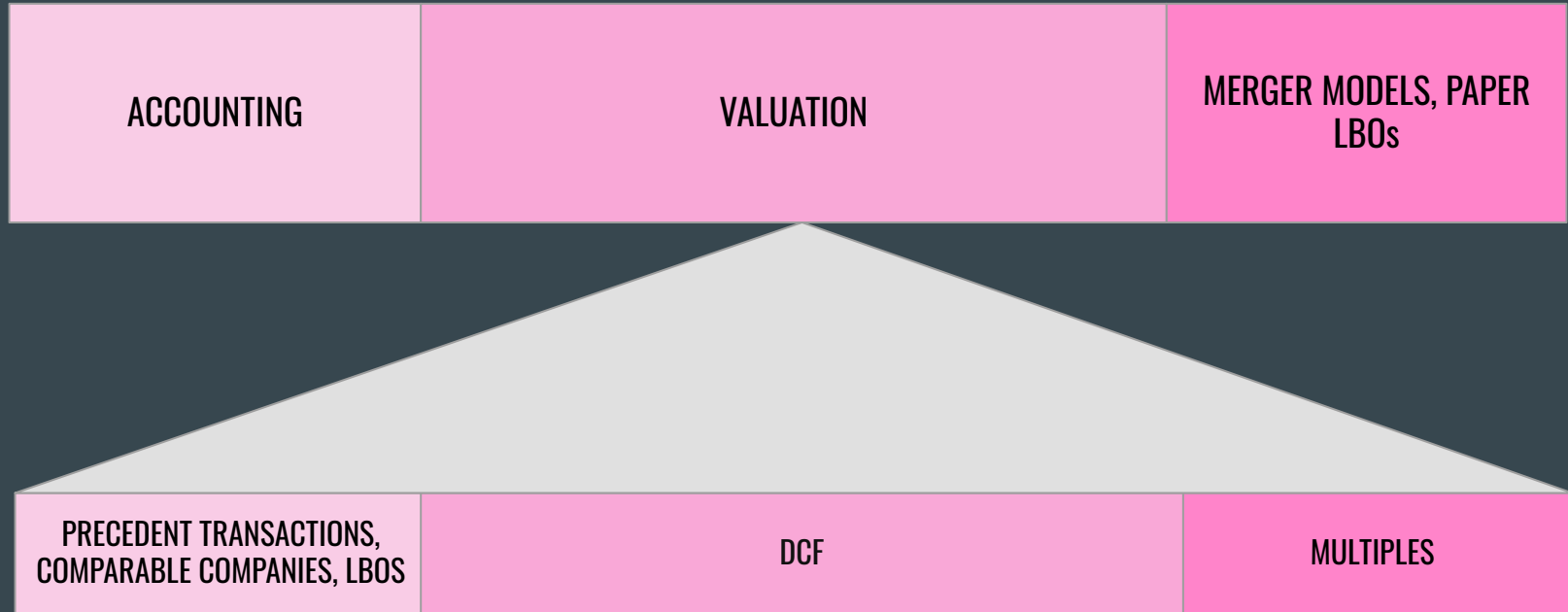
# What is valuation?

- Valuation is the process of calculating the worth of an asset, security, company, etc.
- This is one of the primary tasks that investment bankers do for their clients. Investment bankers will be hired to value a company, often in the context of purchasing another company, selling itself, or divesting a division
- Valuation is either intrinsic or relative

# The 3 Main Ways to Value a Company

1. Comparable Companies Analysis (also called Multiples Analysis)

   **RELATIVE**

2. Precedent Transactions

   **RELATIVE**

3. Discounted Cash Flow Analysis (DCF)

   **INTRINSIC**

# Multiples

- A multiple is a generic term for a class of different indicators that can be used to value a stock
- A multiple is simply a ratio that is calculated by dividing the market or estimated value of an asset by a specific item from the financial statements
- There are enterprise value multiples and equity value multiples within valuation multiples

# Multiples Cont.

Different multiples may be more or less appropriate for specific industries or companies

- **Price/Book Ratio:** if assets drive earnings.
- **Dividends Per Share/Price (aka Dividend Yield):** to compare cash returns VS investment types
- **Price/Sales:** for firms that make losses.
- **EV/Rev:** early stage operating at loss or high growth companies operating at breakeven (no earnings yet).
  - If EBITDA or Net Income is negative, you can't use EV/EBITDA or Price/Earnings

# Enterprise VS. Equity Value

## ENTERPRISE VALUE (EV)

Value of the entire company (both debt and equity)

This is what you pay for a company in event of an acquisition

**Enterprise Value = Equity Value + Debt + Preferred Stock + Minority Interest - Cash**
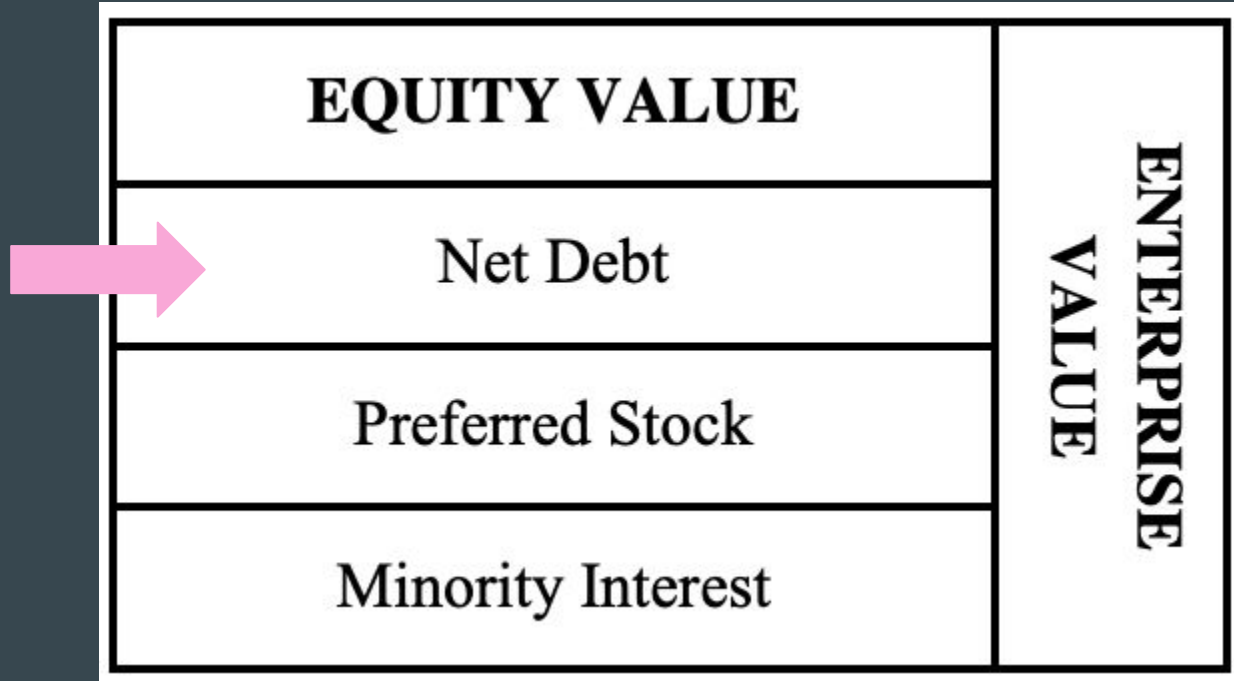
## EQUITY VALUE (E)

The value of the company to just equity holders (owners + shareholders)

Also called Market Capitalization
(market cap)

**Equity Value = # Shares Outstanding X Share Price**

# Enterprise VS. Equity Value

# Net Debt

- Net debt is a company's TOTAL DEBT minus CASH from balance sheet
    - Assumes that a company pays off an debt it can with excess cash on balance sheet

**Net Debt = Total Debt - Cash**

# SIDE NOTE: Subtracting Cash From EV Equation

We subtract cash because it will reduce the acquiring costs of the target company because any excess cash would immediately be used to either pay a dividend to its shareholders or pay off debt, which would reduce the purchase price of a company.

*Think about buying a company for $100M that has $5M of cash on its balance sheet... as the buyer, you would use that $5M dollars to pay off a portion of the takeover price*

**Enterprise Value = Equity Value + Debt + Preferred Stock + Minority Interest - Cash**

# Enterprise Value Multiples

- Enterprise value multiples involve examining ratios between a company's total value and some performance indicator, like earnings, sales, etc.
- Enterprise value multiples include:
  - EV/Sales: Enterprise value to sales
  - EV/EBIT: Enterprise value to EBIT
  - EV/EBITDA: Enterprise value to EBITDA

**Enterprise Value = Equity Value + Net Debt + Preferred Stock + Minority Interest**

# Equity Value Multiples

- Equity value multiples involve examining ratios between a company's share price and some performance indicator, like earnings, sales, etc.
- Common equity value multiples include:
    - P/E: price to earnings
    - PEG: price to earnings to growth
    - P/S: price to sales

**Equity Value = # Shares Outstanding X Share Price**

# Comparable Companies Analysis (also called Multiples Analysis)

Based on the idea that you can determine a company's worth by comparing it to other companies of a similar size in similar industries.

- Decide on a relevant multiple from a group of comparable companies, take the average, and use that average multiple with the operating metric of the company being valued
-  This approach seeks to capture many of a firm's operating and financial characteristics in a single number that can be multiplied by a specific financial metric to yield an enterprise or equity value

# Comparable Companies Analysis Steps

1. Choose your peer group. Comparable companies should be in the same industry and be of a similar size, also consider location, revenue, growth rates, profitability
2. Pull financial data
3. Set up comps table
4. Calculate comparable ratios
5. Use the multiples from the comparable companies to value your company

# Comps Table Example

| Company Name | Market Data | | | Financial Data | | | | Valuation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Price<br>($/share) | Market Cap<br>($M) | TEV<br>($M) | Sales<br>($M) | EBITDA<br>($M) | EBIT<br>($M) | Earnings<br>($M) | EV/Sales<br>x | EV/EBITDA<br>x | EV/EBIT<br>x | P/E<br>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 Transactions

Based on the idea that you can determine a company's worth by comparing it to the prices paid for similar companies in similar situations in the past.

- In this valuation technique, research historical transactions similar to the transaction in question. This involves looking at the size of the companies involved, the industries, the economic context, premiums paid, purpose of transaction (strategic or financial)
- Once you find a comparable transaction, look at how the companies were valued, then calculate a valuation multiple and apply that multiple to the comparable metric of the company valued

# Precedent Transactions

| ($-millions) | | | | | | Multiples | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | Target Name | Acquirer Name | Equity Value | Net Debt | Enterprise Value | EV/Sales | EV/EBITDA | EV/EBIT | Equity/Net Income |
| May-00 | Fox | Hostel | 84.3 | 0.0 | 84.3 | 2.3x | 7.0x | 7.5x | 11.0x |
| Mar-05 | Charlie | Wolf | 34.2 | 50.0 | 84.2 | 2.1x | 7.6x | 8.0x | 11.5x |
| Jun-07 | Delta | Cross | 53.5 | 40.2 | 93.7 | 1.9x | 6.3x | 7.0x | 10.4x |
| Aug-08 | Igloo | Swiss | 23.2 | 0.0 | 23.2 | 3.5x | 8.1x | 9.0x | 12.1x |
| Dec-09 | Apple | North | 100.3 | 80.4 | 180.7 | 2.5x | 7.7x | 8.5x | 11.4x |
| | | | | | | | | | |
| | | | | | High | 3.5x | 8.1x | 9.0x | 12.1x |
| | | | | | Mean | 2.5x | 7.3x | 8.0x | 11.3x |
| | | | | | Median | 2.3x | 7.6x | 8.0x | 11.4x |
| | | | | | Low | 1.9x | 6.3x | 7.0x | 10.4x |

# Precedent Transactions

This valuation technique will typically yield the highest valuation due to the inclusion of a "control premium" that the buyer is willing to pay for the assumed synergies they hope will occur after the purchase.

Synergy is the idea that the combined value and performance of two companies will be greater than the sum of the separate individual parts. There can be revenue synergies, cost synergies, and financial synergies.

*Think about 2 companies merging, you only need 1 CEO... the money you save from paying 1 CEO instead of 2 is a synergy.*

# Discounted Cash Flow Analysis

A DCF is a way to value a company using the time value of money.

Based on the idea that a company is worth the value it has for the future. In a DCF, we assume a company will exist forever, into perpetuity. To do this, we forecast out 5-10 years, then create one big value for the company beyond the forecast forever. This is the terminal value.

The time value of money (TVM) is the idea that money is worth more today than it will be tomorrow because of the potential to invest and make earnings off of money today,

# Walk Through a DCF

Project out free cash flows into the future about 5-10 years, calculate a terminal value for the cash flows after this forecast period, then discount the future cash flows to get their present value.

The present value of the FCF and terminal value are summed to determine an enterprise value

# Terminal Value

The terminal value (TV) captures the remaining value of the target beyond the projection value.

There are two ways to calculate the TV:

1.  Exit Multiple Method

    *The Exit multiple method calculates the remaining value of a target after the projection period on a basis of a multiple of the target's terminal year EBITDA.*

2.  Perpetuity Growth Method (also called Gordon Growth Method)

    *Perpetuity growth method treats the terminal year's FCF as a perpetuity growing at an assumed rate.*

# Free Cash Flow (FCF)

The cash a company generates after taking into consideration cash outflows that support its operations and maintain its capital assets. In other words, free cash flow is the cash left over after a company pays for its operating expenses (OpEx) and capital expenditures (CapEx).

FCF = Cash from Operations - Capital Expenditures

FCF = EBIT (1-T) + Non-Cash Expenses - (Current Assets - Current Liabilities) - CapEX

FCF = EBIT (1-T) + D&A - ▲NWC - CapEX

# Walk Through a DCF

| | 2019 | 2020 | 2021 | 2022 | 2023E | 2024E | 2025E | 2026E | 2027E | TERMINAL VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue** | 100 | 105 | 110 | 116 | 122 | 128 | 134 | 141 | 148 | → ∞ |
| *Revenue Growth Rate* | | 4.8% | 4.6% | 5.2% | 5% | 5% | 5% | 5% | 5% | → ∞ |
| **…** | **Historical Period** | | | | **Forecasted Period** | | | | | **Value beyond forecast, forever** |
| *…* | | | | | | | | | | |
| | **Past Cash Flows** | | | | **Future Cash Flows** | | | | | **Future Cash Flows** |

# Walk Through a DCF

Once we have our future cash flows, we need to discount them back to present day. We discount because of the time value of money  (money today is worth more than money tomorrow).

Typically, we use the WACC for the discount rate. But... if its a LEVERED DCF (less common than an unlevered DCF), we just use the cost of equity.

# WACC

WACC, weighted average cost of capital, is the blended cost of capital across all sources- preferred shares, common shares, and debt.

The cost of each type of capital is weighted by its percentage of total capital and added together.

**WACC = (% Equity X Cost of Equity) + (% Debt X Cost of Debt X 1-T) + (% Preferred Stock X Cost of Preferred Stock)**

# Cost of Equity

To calculate the cost of equity, use the Capital Assets Pricing Model (CAPM).

CAPM calculates the expected rate of return for an asset or investment. CAPM does this by using the expected return on both the market and a risk-free asset, and the asset's correlation or sensitivity to the market (beta).

*This is used in the WACC!*

**Cost of Equity = Risk Free Rate + Beta * Market Risk Premium**

# CAPM: Risk-Free Rate

The risk-free rate is the theoretical return of an investment with no risk. It's used as a benchmark to compare investments that have risk. Typically, the risk-free rate is the yield on the 10-year treasury bond, but can be any default-free government bond yield.

Cost of Equity = Risk Free Rate + Beta * Market Risk Premium

# CAPM: Beta

Beta is a measure of the riskiness of a stock relative to the market. A company with a beta higher than 1 is considered riskier than the market and vice versa.

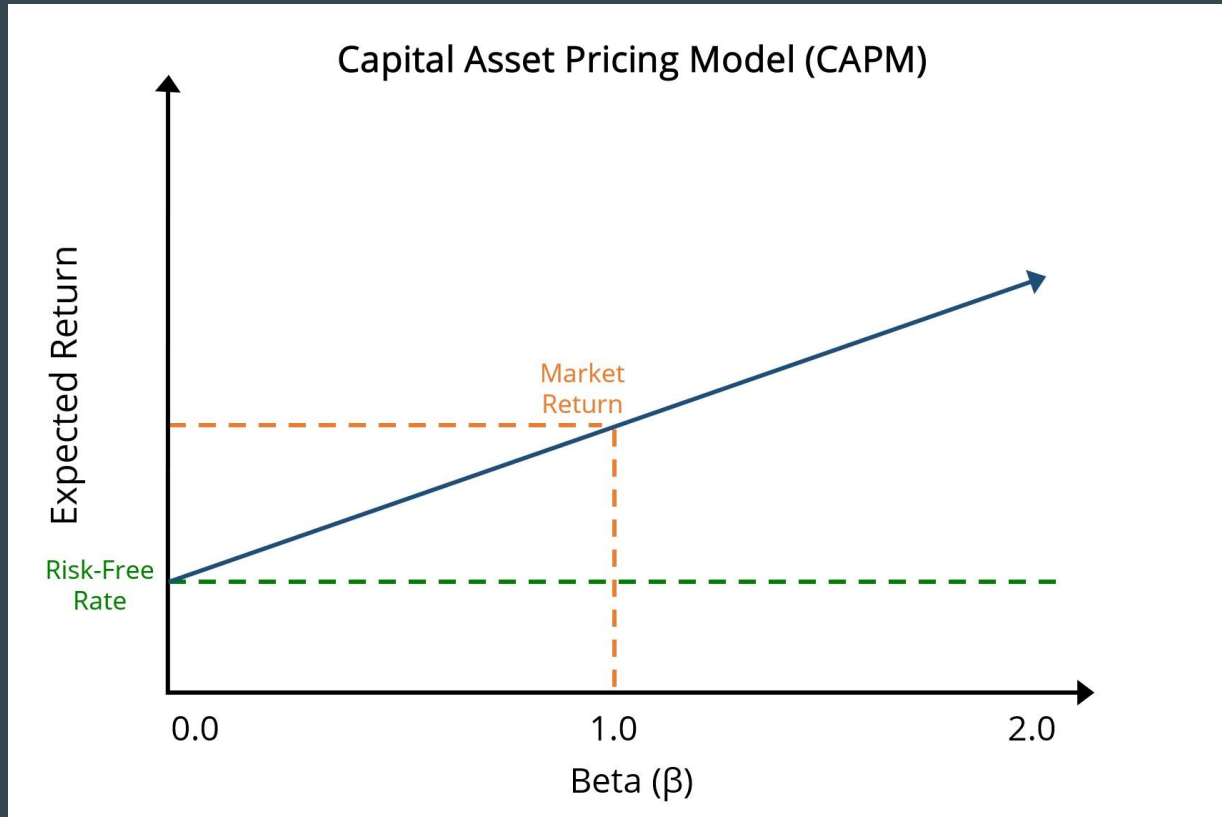**Cost of Equity = Risk Free Rate + Beta * Market Risk Premium**

# CAPM: Market Risk Premium

The market risk premium is the spread of return you get from investing in the markets rather than investing in the risk-free rate.

Expected Rate of Return – Risk Free Rate = Market Risk Premium

**Cost of Equity = Risk Free Rate + Beta * Market Risk Premium**

# Cost of Equity



Capital Asset Pricing Model (CAPM)

Expected Return (vertical axis)

Beta (β) (horizontal axis): 0.0, 1.0, 2.0

Market Return

Risk-Free Rate

# Summary of 3 Main Valuations

**Comparable Companies Analysis:** Idea that companies with similar characteristics should trade at similar multiples, all else equal, and compares valuation multiples.

**Precedent Transactions:** Idea of fair market value, uses previously completed M&A deals involving similar companies to value a business.

**DCF:** The value of a company can be derived from the present value of a company's future cash flows.

# Pros & Cons: Comparable Companies Analysis

**Pros:** Assuming the market is efficiently pricing other companies, it should yield a reasonable valuation. The comparables should reflect industry trends, business risk, market growth etc.

**Cons:** No two companies are perfectly alike, and their valuations shouldn't be identical either. Finding a decent sample of comparable companies can be tricky.

# Pros & Cons: Precedent Transactions

**Pros:** It shows fair market value, willing buyer willing seller. This validates the transaction. And assuming that the transaction data is available and public, it's an easier analysis to perform.

**Cons:** Deals are unique and include control premiums, synergy assumptions, and are impacted by the state of the markets at the time. These factors will affect the purchase price and shouldn't be factored into your valuation.

# Pros & Cons: DCF

**Pros:** Because it's intrinsic valuation & you're looking at the actual cash flows directly, it's theoretically the most sound if you're confident in your projections and assumptions. DCFs are also not heavily influenced by temporary market conditions.

**Cons:** It's only as strong as its own assumptions, meaning different assumptions for different DCFs can yield wildly different valuations. Also, most of the value in a DCF comes from the terminal value, which, because it's a projection into the future, is very subjective.

# Summary of 3 Main Valuations

Because these three valuation techniques each have pros and cons, when you are valuing a company, you will create a valuation range for each methodology and triangulate the three ranges to conclude a valuation range for the company being valued.

Depending on how confident you are with each methodology, you may put more weight on one than the other.

# Highest Valuation

Precedent Transactions: Because of the control premium

DCF: Because of optimistic predictions

Comparable Companies Analysis: Fair Market Value

# Other Ways to Value a Company

1. Comparable Companies Analysis
2. Precedent Transactions
3. DCF
4. LBO
5. Sum of Parts

# Leveraged Buyout

*Simple:* An LBO transaction is the acquisition of a company by a financial sponsor that is financed using a significant portion of debt. The goal of an LBO is deliver high returns on their investment, using debt to increase those potential returns.

*Extended:* An LBO transaction is the acquisition of a company that is funded using a significant amount of debt. The buyer typically wishes to use the least amount of equity possible and fund the balance of the purchase price with debt or non-equity sources. The goal of an LBO is deliver a 20% IRR over a typical 5-7 year holding period, which is captured with a sale either to a strategic or financial sponsor or through an IPO.

# Leveraged Buyout

1.  Calculate the purchase price.
2.  Calculate the debt and equity funding that is used for the purchase price.
3.  Build an income statement and use net income to calculate cumulative free cash flows.
4.  Use the free cash flows to pay down your debt.
5.  Calculate the proforma enterprise value using the EBITDA from the last year, subtract remaining debt to get proforma equity value.
6.  Divide proforma equity value by starting equity value to get multiple of invested capital (MOIC).
7.  Use MOIC to figure out the correct IRR percentage.

# Sum of Parts

The process of valuing a company by determining what its separate divisions would be worth if they were spun off or acquired by another company.

The valuation provides a range of values for a company's equity by aggregating the standalone value of each of its business units and arriving at a single total enterprise value (TEV). The equity value is then derived by adjusting the company's net debt and other non-operating assets and expenses.

# Big Idea: Capital Structure

Capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. A company's capital structure is unique to that company.

Equity capital arises from ownership shares in a company and claims to its future cash flows and profits. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings.

# Big Idea: Debt VS. Equity

Equity is more expensive than debt because the interest on debt is tax-deductible, and that tax-shield makes debt cheaper.

Secondly, debt is senior to equity in a firm's capital structure, meaning in the case of default or liquidation, debt holders get paid first so it's riskier to be an equity holder, and therefore, the cost of equity is higher than the cost of debt.

# Questions You Should be Able to Answer:

1. What is valuation?
2. What are the 3 main ways to value a company?
3. What methodology yields the highest valuation?
4. How do you use the three valuation methodologies to conclude value?
5. What's a 4th way to value a company?
6. What is WACC?
7. Walk me through a DCF?
8. How do you get to free cash flows?
9. What is the terminal value?
10. How do you calculate the terminal value?
11. What is the time value of money?
12. What are the key drivers of a company's performance?
13. List 5 multiples
14. What is an LBO?
15. Explain the difference between Enterprise and Equity Value.
16. What is more expensive debt or equity?

# Applied Questions to Think About:

1. Why do you multiply debt * (1-corporate tax rate) in WACC?
2. What are the assumptions for FCFs?
3. How do you get to LEVERED free cash flows?
4. What's the difference between an unlevered and levered DCF?
5. What's a real-life example of a DCF?
6. What are capital expenditures?
7. What is the capital structure in an LBO?
8. Why do you take the last year of projected FCFs for the TV?

# General Reminders

Sophomores: The sprint is now! Applications are approaching, stay up to date on your email so you don't miss anything.

Apply as soon as you can for things, don't wait until you've networked more or prepped more, you'll never feel ready. Apply ASAP!!

Apply for everything, even if it's not your top choice! You can always use more interview practice, and never know how you can leverage an offer.

Keep your network updated. Let your top choice firm know that they are your top choice. Make sure your network (meaning anyone you've ever networked with) knows when you get into a program or get an offer, especially if it's from another firm.

Schedule mock interviews with the junior and senior leaders! This is the best way to prepare and hold yourself accountable.

# Events Timeline

| | | | |
|---|---|---|---|
| Tues | 1/24/2023 | 2-4pm | Morgan Stanley S&T Chats |
| Tues | 1/24/2023 | 6pm | Morgan Stanley Networking Reception |
| Wed. | 1/25/2023 | 9am | Morgan Stanley Diversity Breakfast |
| | | | |
| Tues. | 2/14/2023 | 7pm | GS Interview Prep for Technicals Workshop |
| Wed. | 2/15/2023 | 7:30pm | RBC Capital Markets |
| | | | |
| Thur. | 2/23/2023 | 4:30 | Harvard Business School |
| | | | |
| Wed. | 3/1/2023 | 4:30pm | Tuck Bridge |
| | | | |
| Mon. | 3/6/2023 | 10:30a-12:00p & 1:00-3:30 | Goldman Sachs Chats 10:30a-12:00p & 1:00-3:30 |
| Mon. | 3/6/2023 | 4:15-5:30p | Goldman Sachs Diversity Networking |
| Mon. | 3/6/2023 | 6:00-7:00p | Goldman Sachs Firmwide Info, |
| Tues. | 3/7/2023 | 8:00-9:00a | Goldman Sachs Women's Breakfast |
| Tues. | 3/7/2023 | 9:30-11:30a | Goldman Sachs Chats |

# Application Timeline

Morgan Stanley Apps: OPEN- Rolling deadline, apply ASAP

CitiBank Apps: OPEN- Rolling deadline, apply ASAP

Barclays Discover Programme: Due February 13th

Goldman Sachs Apps: Tentatively opening March 15