Brandeis Investment Club

Valuation Methodologies

3.5.2025

Brandeis Investment Club

Today's Agenda

1. **Why value companies?**
2. **Valuation Methodologies**
    a. **Public Comparable Companies**
    b. **Precedent Transactions**
    c. **DCF (discounted cash flow analysis)**
        i. **Weighted Average Cost of Capital (WACC)**
        ii. **Cost of Equity**
            1. **Beta**
        iii. **Cost of Debt**
        iv. **Basics of a Discount Cash Flow (DCF) & Real Example**

Goal: be able to answer "What are some ways to value a company?" in an **interview**


Why do we need to value companies?

Public Comparable Companies

Definition: Compare companies because investors need a way to determine if one company is **"more expensive"** than another.

Common Multiples:

- **EV / EBITDA**
- **EV / Revenue**
- **EV / EBIT**
- **P / E (EqV / EPS)**

Often companies are valued based on **forward metrics,** meaning the projections of these financial metrics for the future periods. By using forward metrics, the company's **growth** is considered when determining valuation.

Criteria for Selecting Good Comps:

- **Industry/products**
- **Financial profile**
- **Geography**
- **Size**
- **Growth**

Public Comparable Companies

Comparable Company Analysis

Company	Ticker	Stock Price*	Shrs. Out.=	Market Cap.	+Total Debt	-Cash=	Enterprise Value	Revenue	EBITDA	Net Income	Price to Earnings Ratio	EV/Revenue	EV to EBITDA
Duke Energy	DUK	114.05	774.43	88323.74	80645.00	329.00	168639.74	29060.00	12356.00	4296.00	20.56	5.80	13.65
Southern Co	SO	90.31	1118.52	101013.54	63490.00	748.00	163755.54	25253.00	10847.00	3976.00	25.41	6.48	15.10
Exelon Corp	EXC	40.21	1001.99	40290.02	44008.00	927.00	83371.02	21727.00	7548.00	2328.00	17.31	3.84	11.05
American Electric Power	AEP	100.28	533.44	53493.36	43814.00	593.00	96714.36	19382.00	7319.00	2208.00	24.23	4.99	13.21
Constellation Energy Corp	CEG	285.52	314.39	89764.63	9261.00	454.00	98571.63	21137.00	3666.00	1623.00	55.31	4.66	26.89
			in millions	in millions	in millions	in millions	in millions	in millions	in millions	in millions			

* as of Oct 4, 2024 4PM

Min	17.31x	3.84x	11.05x
1st Quartile	21.38x	4.75x	13.32x
Median	24.03x	5.40x	14.37x
3rd Quartile	25.11x	6.31x	20.99x
Max	55.31x	10.75x	26.89x

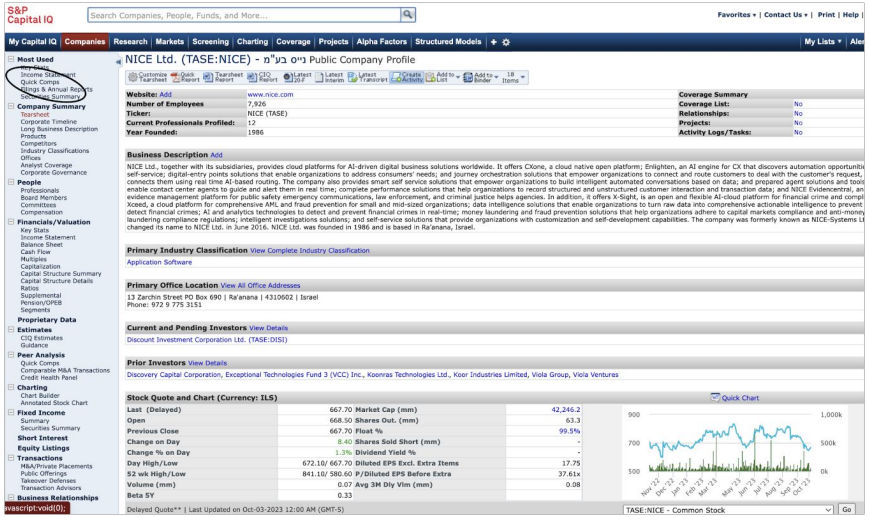
Target Company	Ticker	Stock Price	Shrs. Out.	Market Cap.	Total Debt	Cash	Enterprise Value	Revenue	EBITDA	Net Income	Price to Earnings Ratio	EV/Revenue	EV to EBITDA
NextEra Energy	NEE	83.85	2078.16	174253.72	73623.00	2705.00	245171.72	22809.00	10678.00	7310.00	23.84	10.75	22.96
			in millions	in millions	in millions	in millions	in millions	in millions	in millions	in millions	in millions		in millions

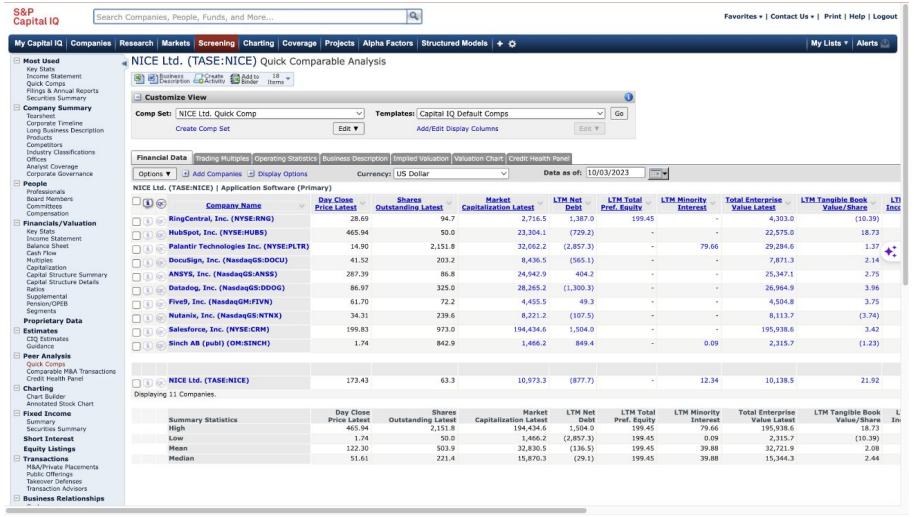
	1st Quartile	Median	3rd Quartile
P/E Implied Share Price	$ 75.20	$ 84.53	$ 88.33
EV/EBITDA Implied Share Price	$ 33.03	$ 38.42	$ 72.45

Note:

1. 5 Companies listed
2. Found P/E and EV/EBITDA implied share price based on 1st quartile, median, and 3rd quartile

Public Comparable Companies (CapIQ)





Note:

1. Lots of companies listed automatically (DONT TAKE AUTOMATIC ONES DO YOUR OWN RESEARCH)
2. Automatically pulls data that you can download in excel

Precedent Transactions

Step 1: Compile Comparable Transactions

- Identify relevant past transactions for benchmarking.

Step 2: Conduct Market Research

- Gather industry trends and factors influencing purchase multiples.

Step 3: Input & Adjust Financial Data

- Organize and standardize financials, adjusting for non-recurring items, accounting differences, and seasonality.

Step 4: Calculate Peer Group Multiples

- Compute valuation multiples (LTM & NTM) and summarize key statistics (min, median, max, percentiles).

Step 5: Apply Multiples to Target

- Use median/mean multiple to estimate target value, considering key deal drivers and unique factors.

DCF Overview

- The basic theory of a DCF is that a **business is worth the sum of its expected future cash flows discounted to the present value** using a discount rate that reflects the riskiness of the cash flows.

$$Value\ of\ Business = \sum_{t=1}^{t=n} \frac{Cash\ Flow_t}{(1 + Discount\ Rate)^t}$$

Note: we discount because of time value of money (money tomorrow is worth less than today)

- **Example**: Consider a business with the following expected future cash flows. Assume the **discount rate is 10%.**

Time Period	Year 1	Year 2	Year 3	Year 4	Year 5
Cash Flows	$100	$105	$110	$115	$120
Present Value of Cash Flows	$\frac{100}{(1+.1)^1}$	$\frac{105}{(1+.1)^2}$	$\frac{110}{(1+.1)^3}$	$\frac{115}{(1+.1)^4}$	$\frac{120}{(1+.1)^5}$

Sum of Present Values = $\frac{100}{(1+.1)^1} + \frac{105}{(1+.1)^2} + \frac{110}{(1+.1)^3} + \frac{115}{(1+.1)^4} + \frac{120}{(1+.1)^5}$

Sum of Present Values = $413.39

Basics of a DCF analysis

- **Description:**
  - Intrinsic valuation methodology
  - **Discount projected free cash flows and terminal value** at cost of capital to obtain enterprise value, then subtract net debt to derive equity value
- **Steps:**
  1. Calculate unlevered FCFs 5-10 years
  2. Calculate terminal value
  3. **Calculate WACC (weighted average cost of capital)**
  4. Determine PV of FCFs + terminal value = enterprise value
  5. Solve for equity value and implied share price (upside)

Equity

Market Value of Equity / Company Total market Value * Cost of Equity

Company Total Market Value = Company Debt + Equity

Cost of Equity = Risk Free Rate + Beta (Market Return of stock - Risk Free Rate

Market Value of Equity = share price * diluted shares

Assets	This Year	Last Year
Current assets		
Cash and cash equivalents	$ 10,000	$ 10,000
Accounts receivable	35,000	30,000
Inventory	25,000	20,000
Total current assets	**70,000**	**60,000**
Fixed assets		
Plants and machinery	$ 20,000	$ 20,000
Less decreciation	-12,000	-10,000
Land	8,000	8,000
Intangible assets	2,000	1,500
Total assets	**88,000**	**79,500**
Liabilities and Shareholders' Equity		
Liabilities		
Accounts payable	$ 20,000	$ 15,000
Taxes payable	5,000	4,500
Long-term bonds issued	15,000	10,000
Total liabilities	**40,000**	**29,500**
Shareholder's equity		
Common stock	$ 40,000	$ 40,000
Retained earnings	8,000	10,000
Total shareholder's equity	**48,000**	**50,000**
Liabilities and shareholders' equity	**$ 88,000**	**$ 79,500**

Cost of Equity

Cost of Equity = Risk Free Rate + Beta (Market Return of stock - Risk Free Rate)

Risk Free Rate = 10 Year Treasury Rate (google)

Beta (levered) = Volatility of a stock compared to the market

Market Return of Stock = Expected Return of Equity Markets

$$r_e = r_f + \beta(r_m - r_f)$$

where

r_e = Required Return on Equity

r_f = Risk-free Rate

r_m = Market Return

β = Stock Beta

$(r_m - r_f)$ = Equity Risk Premium

Beta

Unlevered: Does not incorporate capital expenditures into calculation

Remove any financial leverage, allows to see just market risk of company assets

Levered: Includes capital expenditures. Used for calculations.

Beta = 1; Asset moves with the market

Beta > 1; Asset is more volatile than market

Beta < 1; Asset less volatile than market

Unlevering Beta

$\beta_U = \beta_L / [1 + D/E * (1 - T)]$

β_U = unlevered (asset) beta

β_L = levered (equity) beta

D/E = debt-to-equity ratio

T = marginal tax rate

Relevering Beta

$\beta_L = \beta_U * [1 + D/E * (1 - T)]$

β_L = levered (equity) beta

β_U = unlevered (asset) beta

D/E = target debt-to-equity ratio

T = marginal tax rate

Cost of Equity

$$WACC = \frac{V_e}{V_e + V_d} \times C_e + \frac{V_d}{V_e + V_d} \times C_d$$

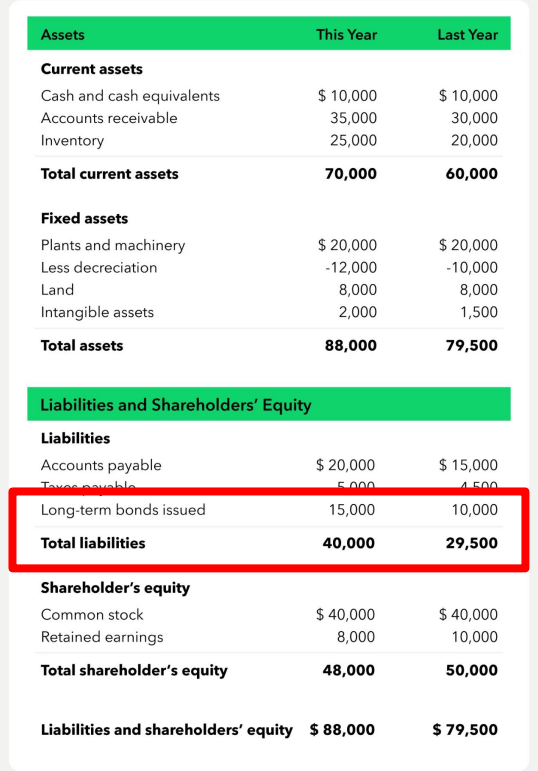
Debt

= Cost of Debt * (1 - Tax) * Market Value of Debt/ Company Total Market Value

Tax = Tax Rate of Company (From 10k)

Cost of Debt = Interest Expense / Total Debt

Market Value of Debt = From Balance Sheet



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Summary

1. **Public Comparable Companies**
   a. Find companies similar to compare with (10k, CapIQ, Bloomberg Terminal EQRV)
   b. Calculate multiples (EV/EBITDA, P/E, etc.)
   c. Find implied share price
2. **Precedent Transactions**
   a. Find comparable deals
   b. Conduct Market Research
   c. Input & adjust financial data
   d. Calculate peer group multiples
   e. Apply multiples to target
3. **DCF (discounted cash flow)**
   a. Calculate unlevered FCFs 5-10 years
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   c. <u>Calculate WACC (weighted average cost of capital)</u>
   d. Determine PV of FCFs + terminal value = enterprise value
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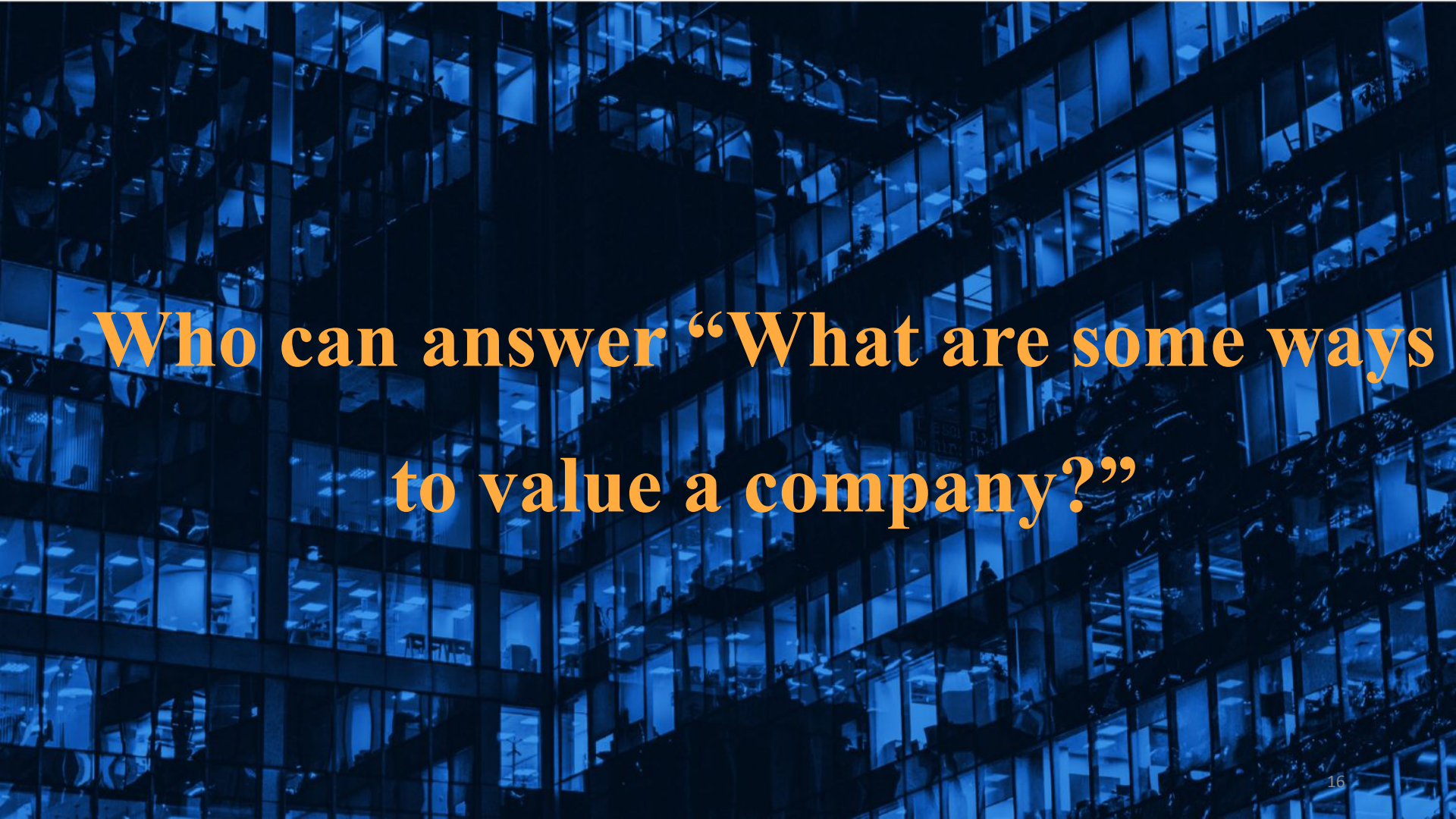
Who can answer “What are some ways to value a company?”