Total Return Requirement

The Structural and Market Approach

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UCONN

1 Introduction

What are we going to do during this class:

- The DCF valuation problem can be thought of in two analytical steps;
  - Forecast the future expected net cash flows from the property.
  - Determining the appropriate total return requirement.

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1 Internal Rate of Return

- Given this is an investments class, we are interested in much **return** our investment will generate.
- Although note, that we always talk about **expectations**.
- In the last module we talked about the cash flows of the property. This included operational and reversion cash flows.
- If you compare these cash flows with the initial investment, you can compute your return.
- Say we have a 10-year cash flow prediction;
  - In the first three years we will make $1M per annum.
  - Year (4) to year (6) will generate $1.5M per annum.
  - Year (7) to year (10) will generate $2M per annum.
  - We sell the property for $20M in year (10). (We calculated this using the direct capitalization technique discuss in previous class.)
  - Say we bought the property for $18M, what is our **internal rate of return**?
  - (Use IRR() function in Excel.)

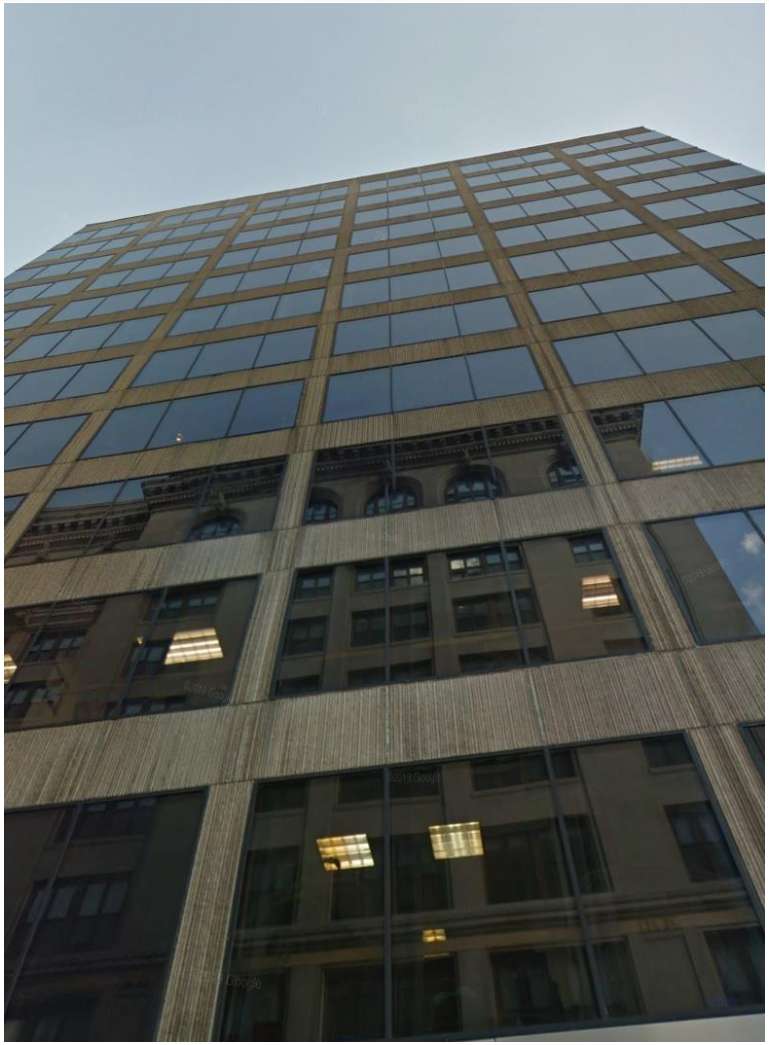
1 Discounting Cash flows

- In reality, we – as investors – do it the other way around.
  - We predict our cash flows. (We already have the cash flows on the previous slide.)
  - However, we do not compute the IRR, instead we give an IRR upfront. This is called the **discount rate,** or **going-in IRR**, or **total return** requirement.
  - Summing the discounted cash flows will give us a the value of the investment. (Obviously, the buyers wants to pay less, but unfortunately for the buyer, the sellers wants to sell for more!)
  - We can do this, because the future cash flow the property can yield is independent of the prices investors pay today for the property.

- In the previous example. Say we have a 7% return requirement. What is the price of the property?

1 Our property of interest

- 141 Tremont street.
- Which is Boston CBD.
- Office tower.
- 66,350 square feet.
- Construction year: 1970s.
- 13 Floors.



2 How to Determine the Total Return Requirement

- Again, what is a “total return requirement”?
  - It is the multiperiod (again, we use 10 years), dollar-weighted average **total return expected** by the investor.
  - It is in the form of a going-in IRR.
  - We designate it $E[r]$.
    - E: expected
    - r: return
- The return requirement, must reflect the risk in the (future) cash flows. Thus, denominator and numerator of a DCF are linked.
- Note that a total return consists of **return of asset + income return**.

2 General Observation of OCC

- As you (should) know, the DCF total return requirement is meant to be the **opportunity cost of capital** (OCC) of the investment.
- More specifically, it the return the investor would get on another investment, with similar risk.
- For our first methodology, we are going to compute the total return using the following Eq.
  - **r_T = Risk free rate + Risk premium**
  - **$r_T = r_f + RP$**

3 Risk free rate

- With the first method, we need to first find a risk free rate.
- Very typical in finance is to take the short term T-bill rate.
- https://fred.stlouisfed.org/series/DGS1MO

- The US government will not bankrupt within 1 month. (I hope…)
- However (!) real estate is a long run investment (again, say 10 years). We therefore need the take the average 1 month T bill rate over the next 10 years. You can start with the 10 year T bill rate;
- https://fred.stlouisfed.org/series/DGS10

- However, note that this is not entirely fair, as there is a risk premium, on the 10 year rate, as compared to 10 years of 1 month T bills.
- You will need to correct for this “yield curve effect.” This will lower the 10 year T bill by about 150 bps.

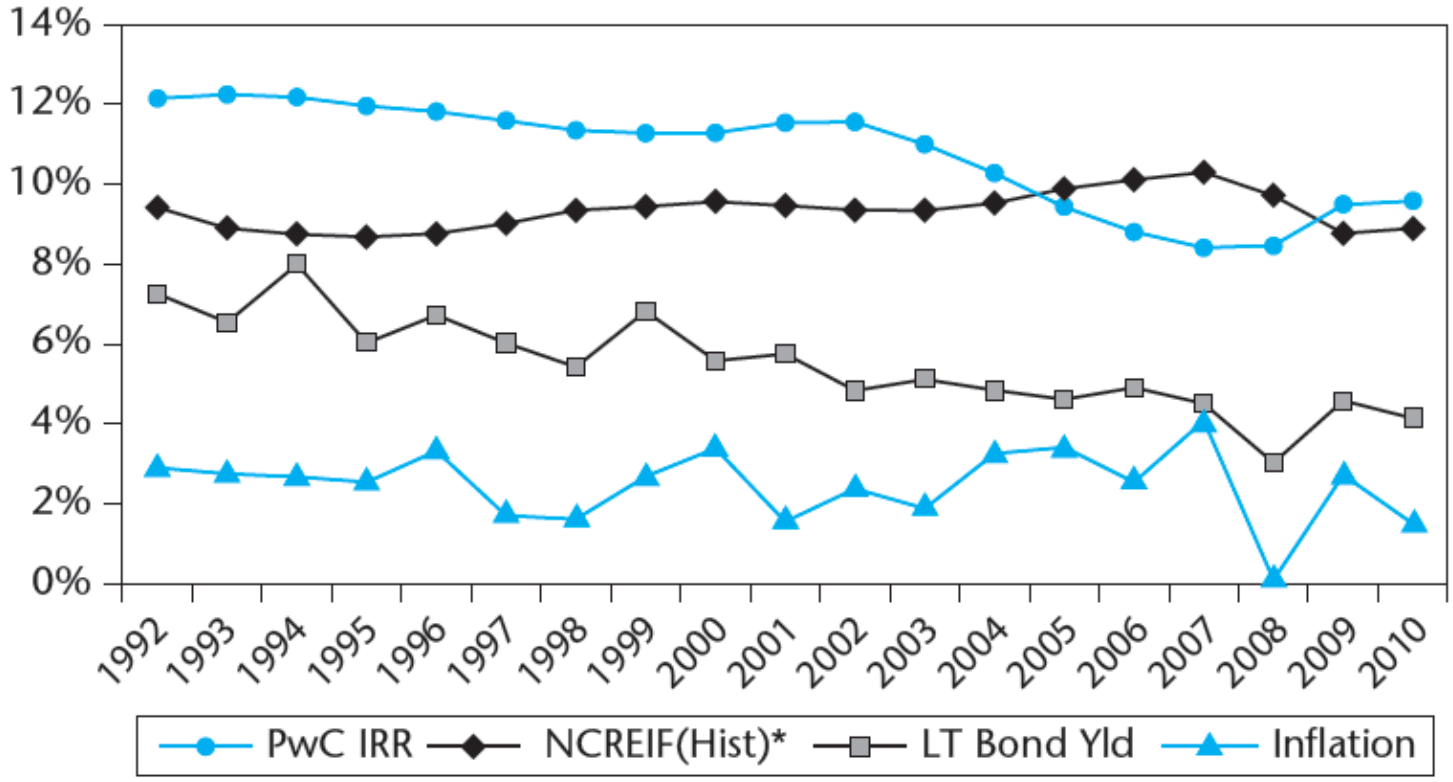
3 Risk premium

	Total Return	Risk Premium
T-Bills	3.00%	NA
Boston Apartment	10.0%	7.0%
Inland Empire Commercial	9.6%	6.6%
NY boroughs Apartment	14.2%	11.2%

- We can get Total Return from **NCREIF data**, or other sources like CoStar and REIS.

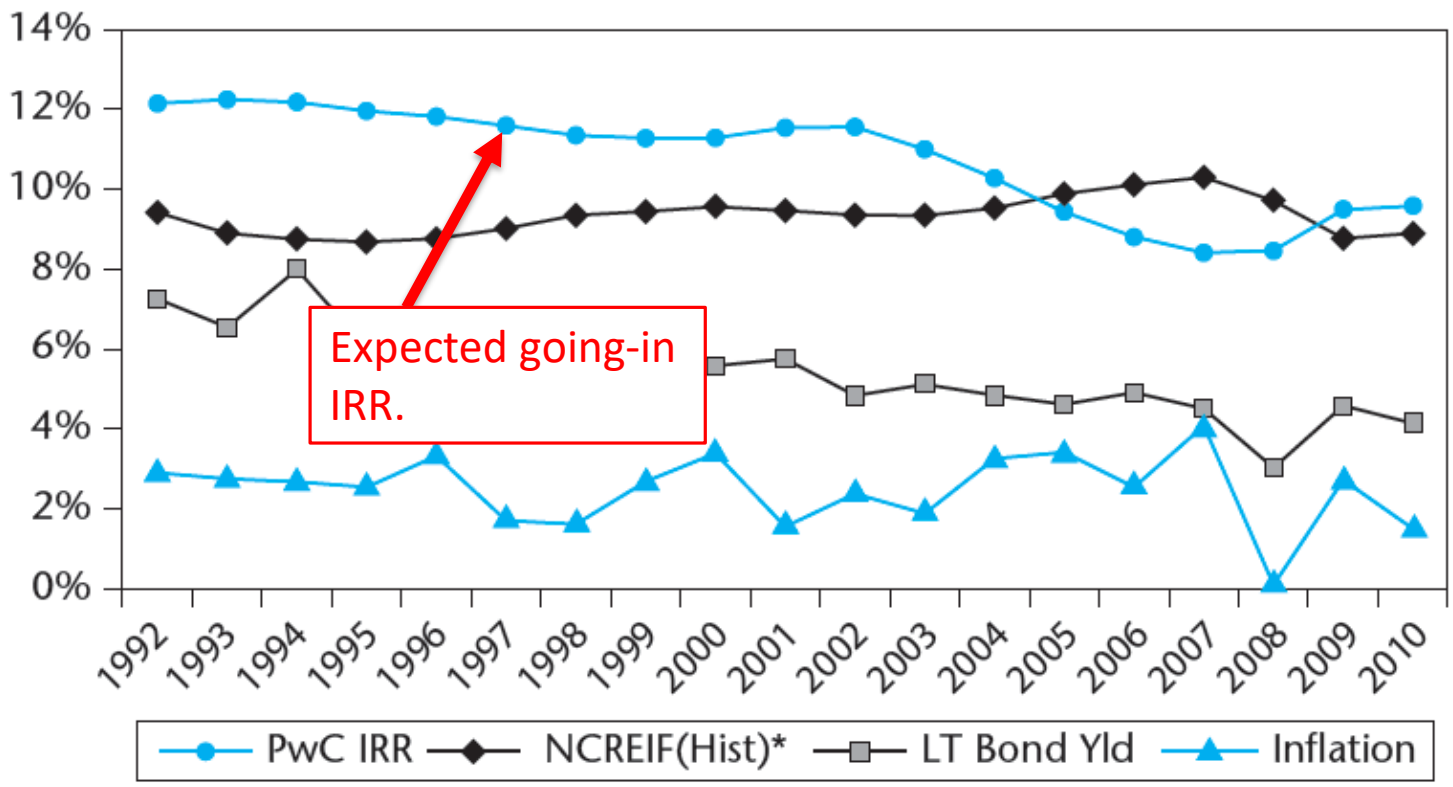
- However, note that this is the actual realized returns, not what was expected.
- Still, investors use historic outcomes to predict the future, so probably not too far of.

3 Risk premium



* Trailing NCREIF average annual total return since 1977.

3 Risk premium



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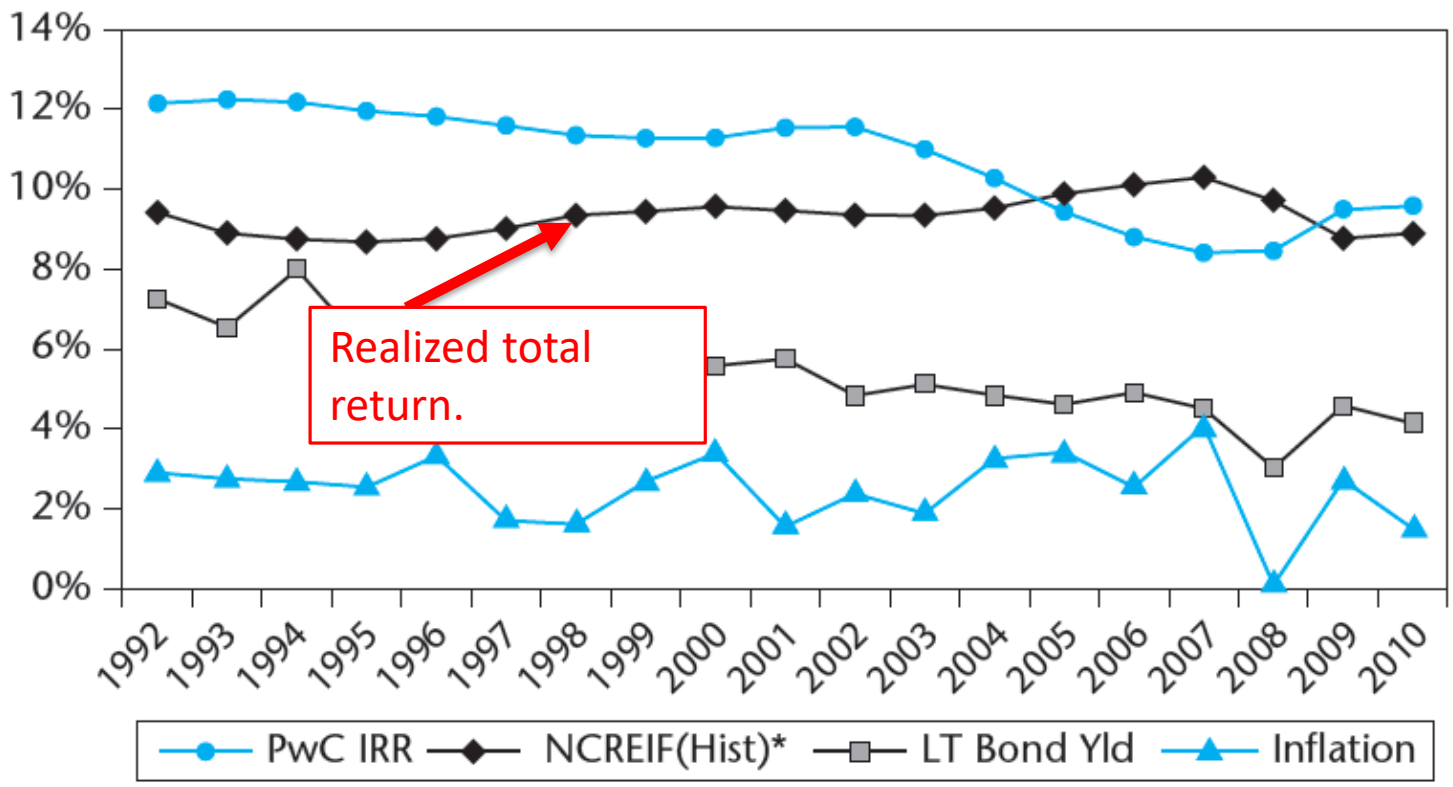


4 The Market Approach

- Remember when we talked about how we use the Gordon Growth Model to compute the terminal value?
- What we found was: $\mathrm{P_t} = \frac{PBTCF_{t+1}}{r - g}$,
- There is a lot of data on empirical cap rates, where **c = r – g**.
- We also know g, as we computed it earlier in class.
- **This we can reverse engineer, r = c + g.**
- We can find the relevant cap rate (c) by doing a **comparable analysis**.
  - However, note that c is NOI-based, and total return is PBTCF based. Thus you have to correct the cap rate taking CapEx into account. Simply use: 0.7 x c.
  - But what about g?

4 Sales Comparison Approach

- Appraisal slang for this approach is "**comps analysis.**"
- The idea is very simple; find a comparable property that got sold and use those cap rates to find c for your target property! Very simple, right?
- Unfortunately, this is not always so simple;
  - Properties that got sold at an auction, or foreclosures do not count as they were not sold under "normal" sales conditions.
  - One property is not the same as the next.
    - Location is different.
    - Property characteristics are different. (Size and age of the property.)
    - Property type might be different. (Comparing an office with retail.)
  - Also, you inherently look back in time to do your appraisal. You have to look at properties that **got** (ergo in the past) sold, meaning you have to look back. This introduces an **appraisal lag**.

4 Sales Comparison Approach

- There is a general trade off between finding similar properties, and the amount of lag you introduce. What would you choose as a comparable;
  - An identical property, but it was sold two years ago.
  - A completely different property, but it was sold yesterday.
- There is no one answer to this question, and it depends case-by-case. We must understand that appraising is an art and not a science.

4 Sales Comparison Approach

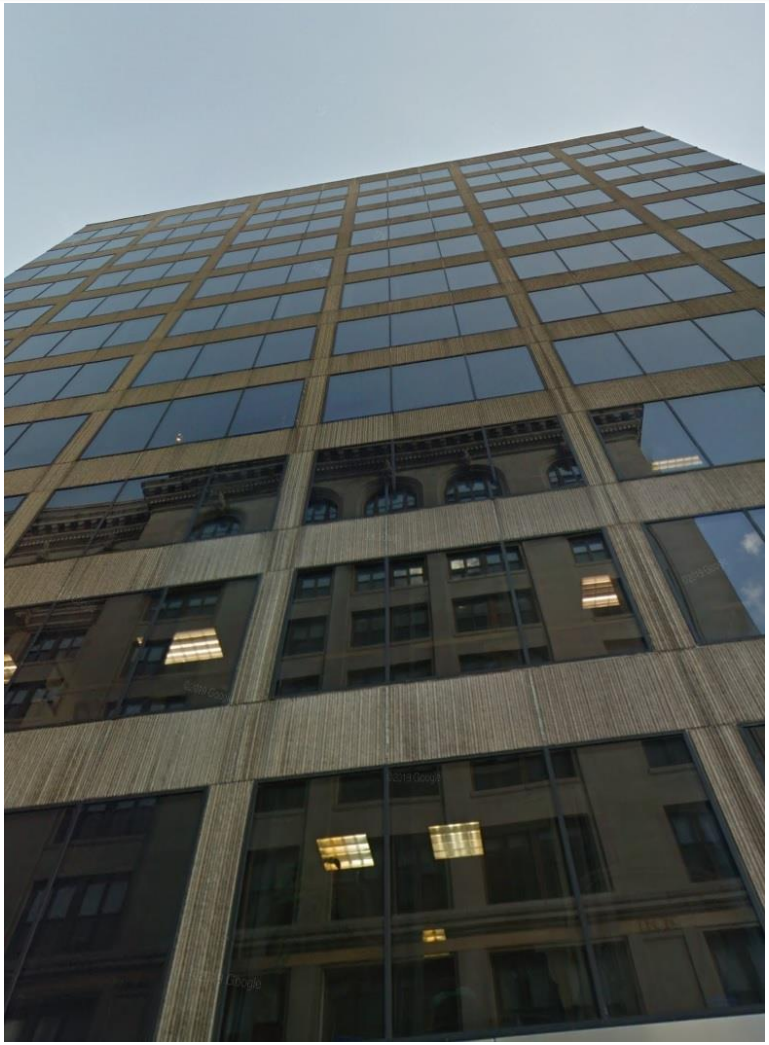
- Typically, an investor tries to find **3 / 10 comparable sales**, that were sold relatively recently, have the same use, etc.
- You can also weigh these properties differently, based on how sure you are that they are a good comparable. So one property might get 60% of the weight and the other two 20%.

- Let’s give a quick example of how this could work.

4 Sales Comparison Approach

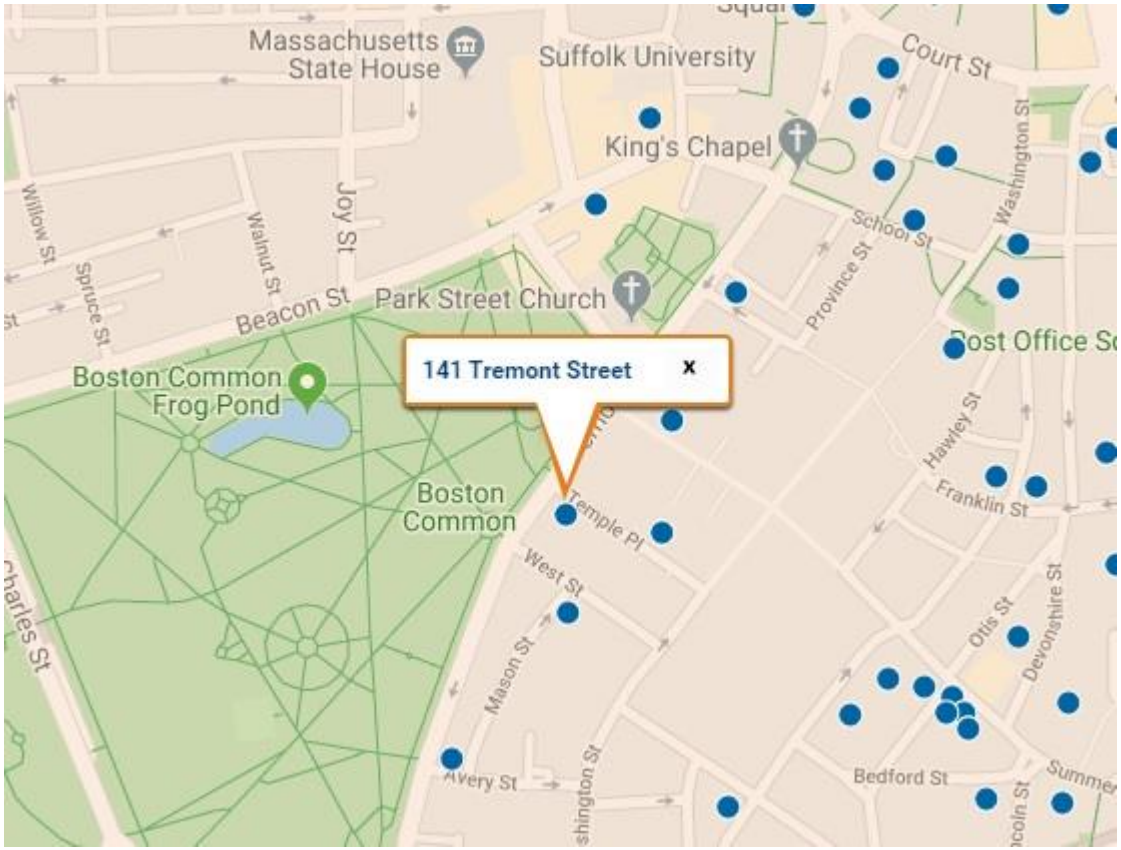
- 141 Tremont street.
- Which is Boston CBD.
- Office tower.
- 66,350 square feet.
- Construction year: 1970s.
- 13 Floors.

- **What are comparable properties, and what is the cap rate?**



4 Sales Comparison Approach

- We should probably look for transactions within the same area, that happened within 5 years or so.
- Should be the same property type.
- Should also be built in the 70s.
- We find the square foot prices of said properties.



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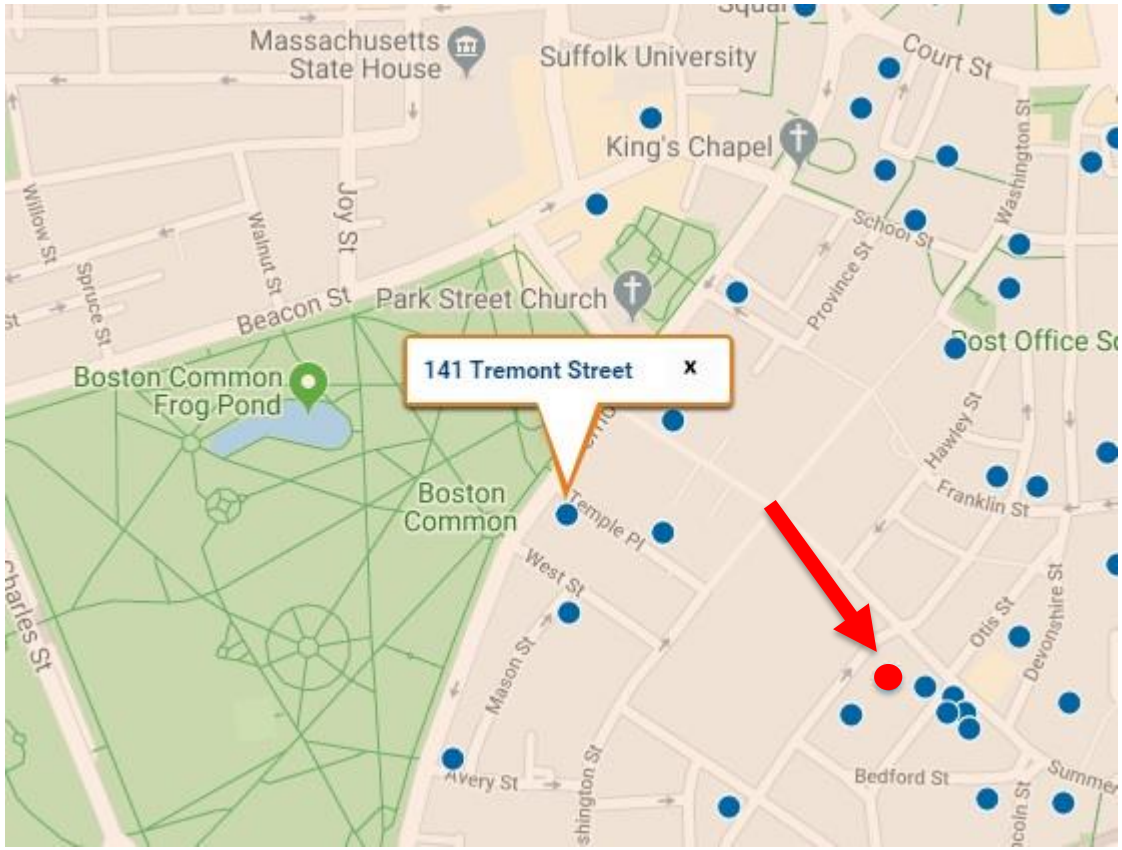
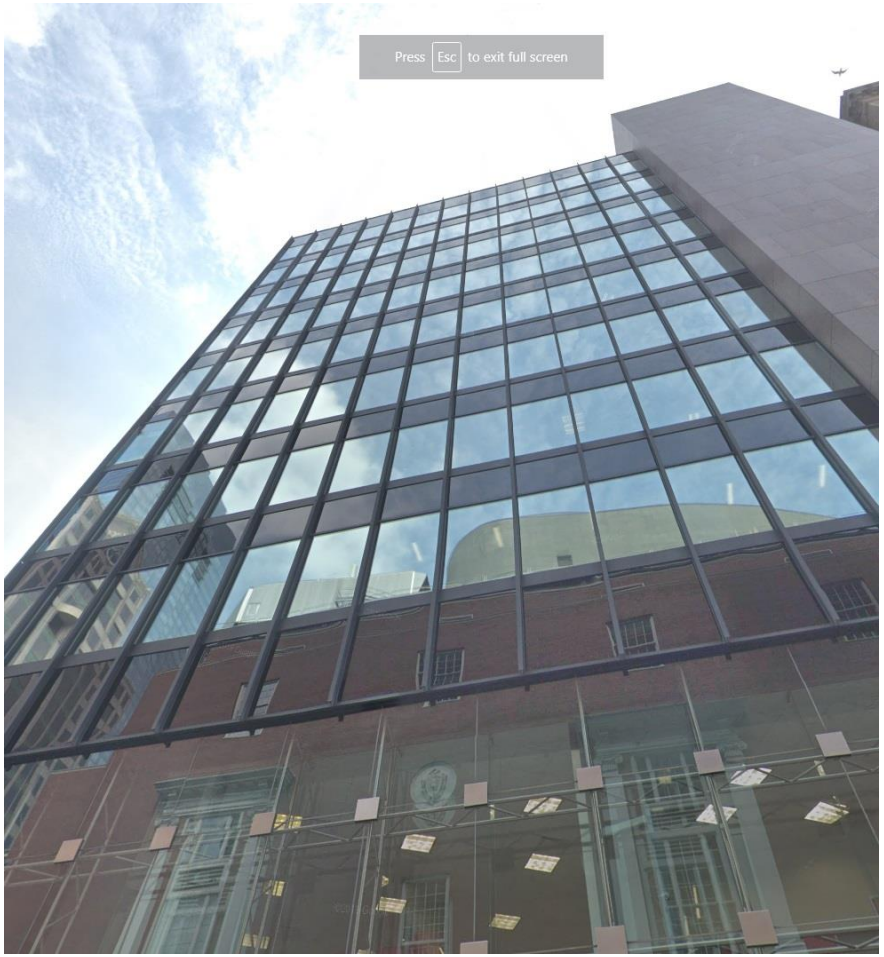


4 Sales Comparison Approach

- 55 Summer street.
- Boston CBD.
- Office tower.
- 125,661 square feet.
- Construction year: 1970s.
- 10 Floors.

- **Sales price: $62.9M**
- **Price per square foot: $500**
- **Cap rate: 8.0%**
- **Year of sale: 2023 (May)**



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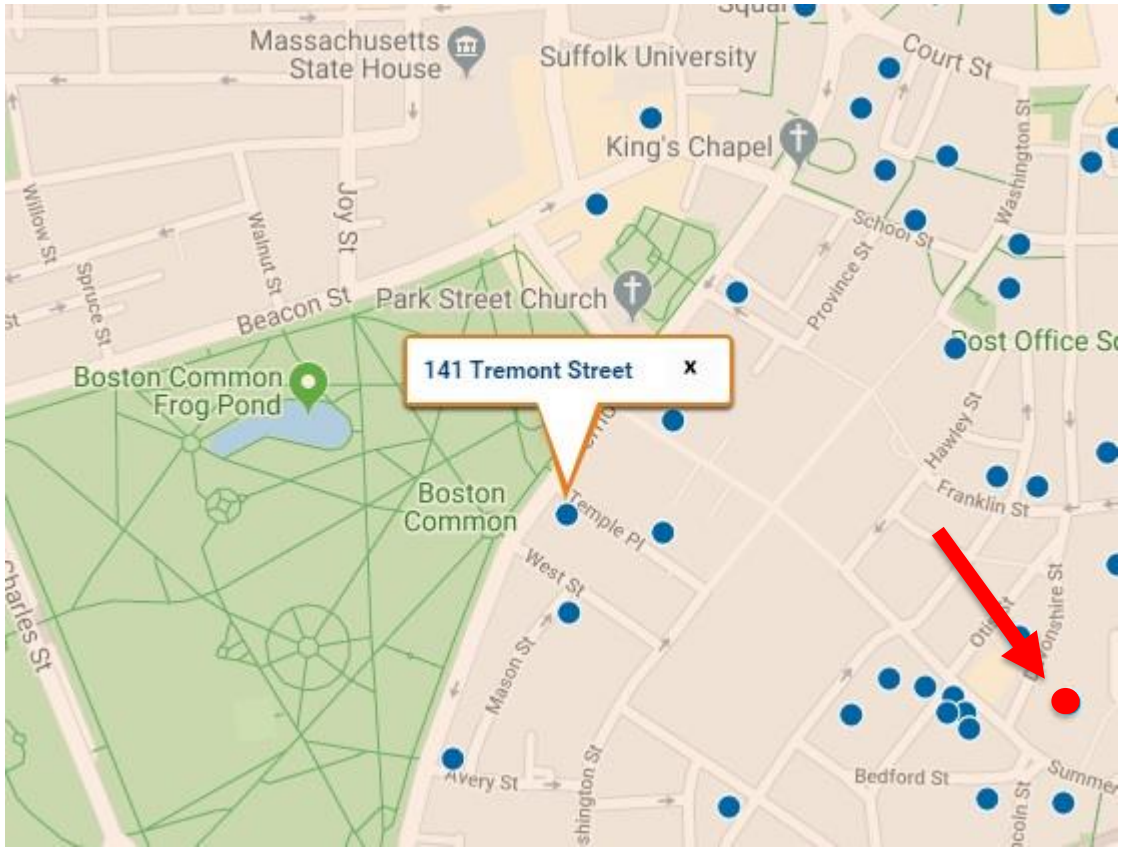
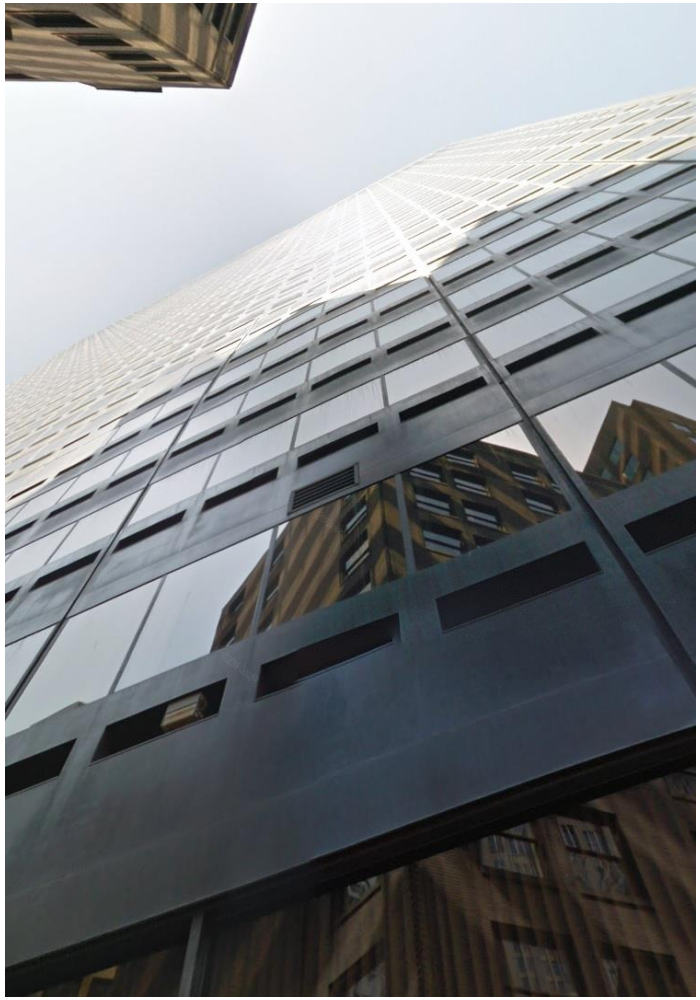


4 Sales Comparison Approach

- 100 Summer street.
- Boston CBD.
- Office tower.
- 1M square feet.
- Construction year: 1970s.
- 32 Floors.

- **Sales price: $806M**
- **Price per square foot: $800**
- **Cap rate: 7.9%**
- **Year of sale: 2024 (Sep)**



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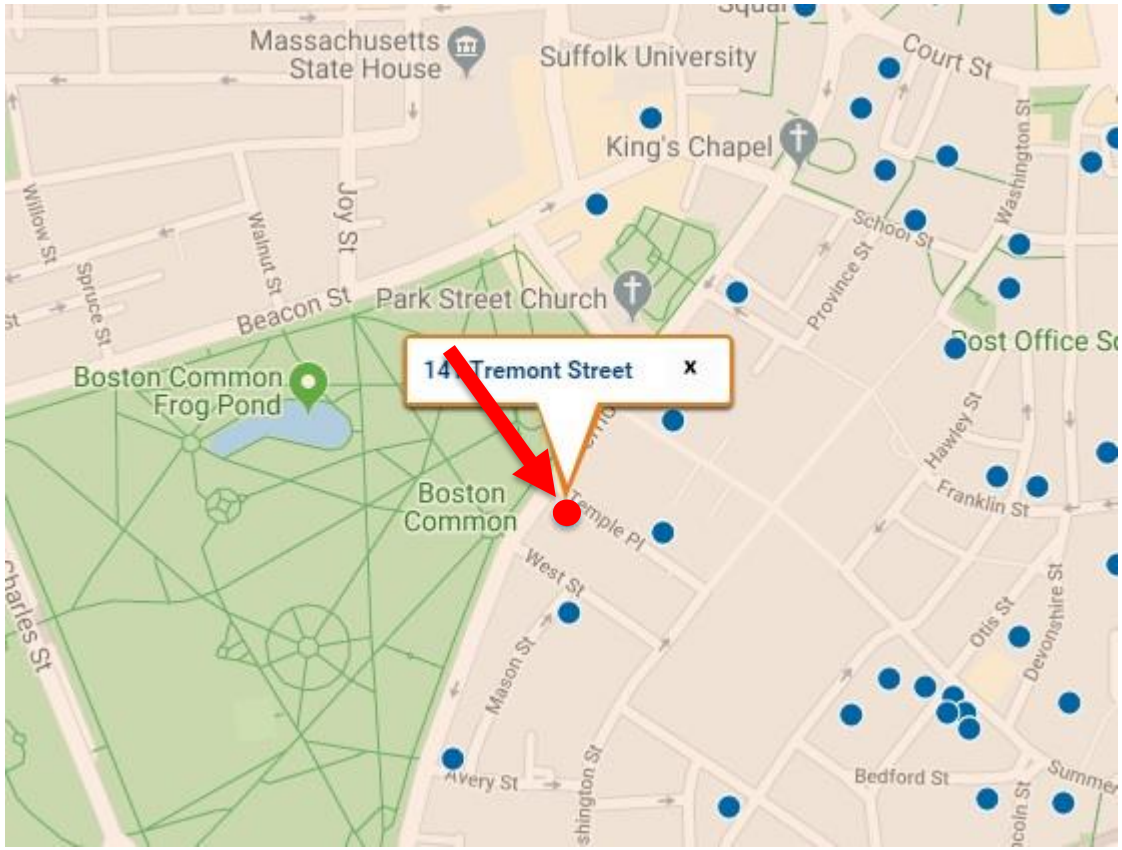
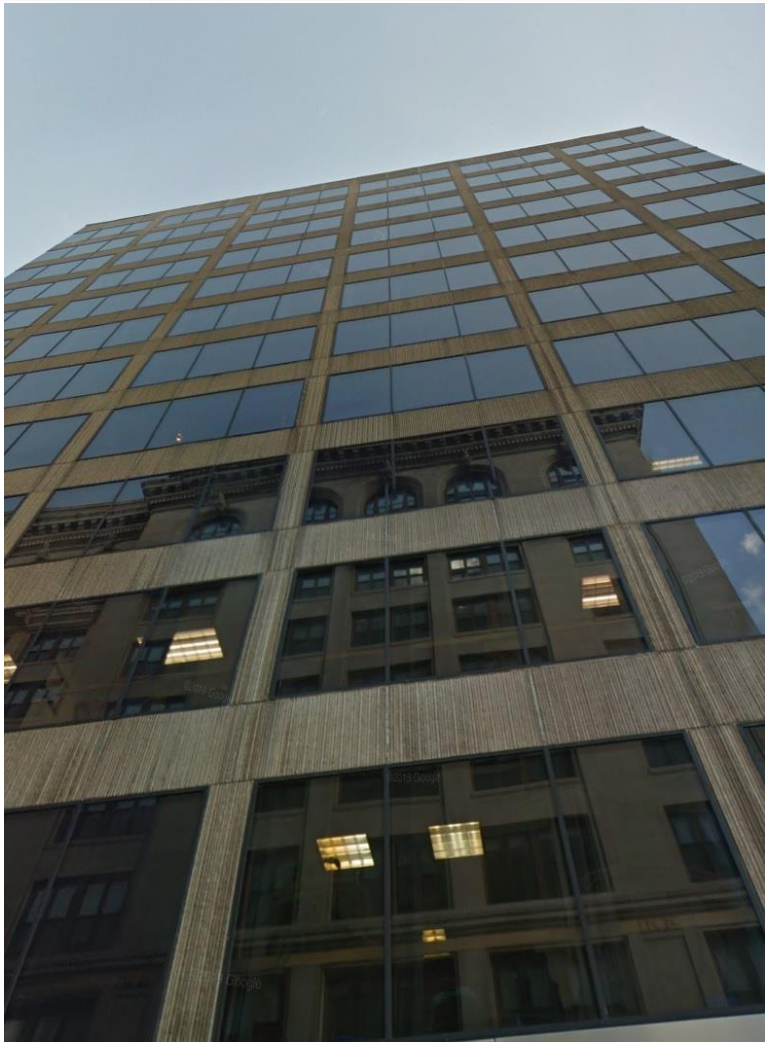


4 Sales Comparison Approach

- 141 Tremont street.
- Which is Boston CBD.
- Office tower.
- 66,350 square feet.
- Construction year: 1970s.
- 13 Floors.

- **Sales price: $27M**
- **Sales price per square foot: $400**
- **Cap rate: 7.8%**
- **Year of sale: 2021 (Jan)**

- **Wait a second! This is our property!!!**



4 Sales Comparison Approach

- Thus we get;

– Property #1:	8.0%	2023 (May)
– Property #2:	7.9%	2024 (Sep)
– Property #3:	7.8%	2021 (Jan)

- Next we want **to put some weights based** on which comparable is the best.
- You can also make some **corrections** if you feel it necessary.
- In our case though, with just three properties, and very similar results, we can simply take an 8% cap rate.
- Multiply this with 0.7 (to take the CapEx out of NOI), and you end up with an income yield of 5.6%.
- Finally, add your growth expectation in NOI and add it to the income yield.

Interlude

- If we get two different values for the two different approaches, which one is better?
  - **The structural approach** is the return requirement what is *should* be.
  - **The market approach** gives the return requirement as *it currently is*.
- Thus the first might be better, the latter is what happens. If the market approach gives a smaller return requirement compared to the structural approach, it might indicate a bubble! In reverse, it might mean there are opportunities.
- If the differences are close together, don’t worry too much and pick the market approach.

Interlude

- There are other approaches available as well.
  - **Survey-based**. Certain companies survey investors, asking them what their going-in IRRs were for a specific market/year.
  - **Corporate bonds**. This is a bit tricky, but possible for an office building with corporate tenant(s). The tenant's bond reflects—sort of—a similar risk.

- You might want to subtract a few basis points to reflect the depreciation in cash flows.

5 Exit Yield

- Remember that we also need market evidence to compute the exit-cap rate in our pro-forma.
- By now you already know how to do this.

5 Exit Yield

- Remember that we also need market evidence to compute the exit-cap rate in our pro-forma.
- By now you already know how to do this.
- It is the same comparable approach as before, however;
  - Property has to be 10 years older compared to you.

- Again, pick 3/10 comparable properties. Although not completely comparable, because we age the property with 10 years.
- It typically means a cap rate that is about 50-100 bps higher. Although in our specific case (property built in the 1970s) it might not matter or is even reversed. Just find the relevant comparables.
- Although... Why does age matter?

5 Exit Yield

	Property 1	Property 2	Property 3
Location	1 Upland Rd	40 Sylvan Rd	535-545 Boylston St
Size	243,000	348,961	184,643
Construction year	1960s	1960s	1960s
Cap rate	6.50%	6.50%	6.00%
Year of sale	2020	2024	2021
Adj cap rate	**6.80%**	**6.50%**	**6.50%**

5 Depreciation

- So how does depreciation in general get reflected into cap rates (r - g)?
- Note that depreciation mostly affects rent.
- Interestingly, there are two contradicting forces;
  - The older the property gets, the less g will be impacted.
  - Older properties might be harder to lease when they get older, thus the risk, or r get impacted.
- Thus, in general, you will find that the cap rate is hardly affected. There are two exceptions;
  - Very young properties will see an increasing cap rate, because g will decrease relatively more compared to r increasing. (Cap rate goes up. **Cap rate creep**)
  - Very old properties will see a large increase in g. Why? Because HBU changed so much, and an old property is easy to demolish, we get a redevelopment option value, which is not reflected in current rents, but in rent expectations. (Cap rate goes down.)

5 Depreciation