Micro-Level Real Estate Investment and Finance

This presentation completes our exploration of micro-level real estate investment analysis. We'll build on financial and urban economics principles to examine property valuation, cost of capital, leverage effects, and tax implications.

DCF Valuation: Numerators and Denominators

Numerators

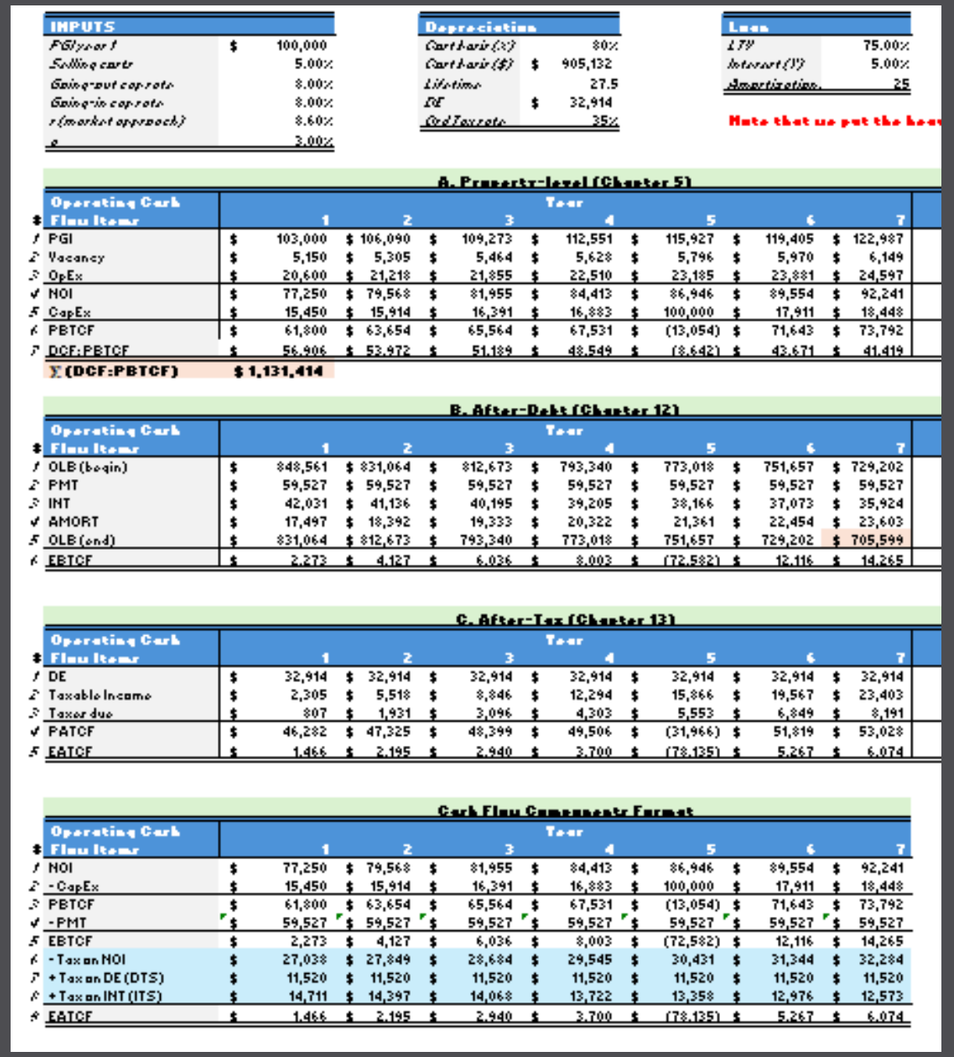
Cash flow projections reflecting the space market dynamics.

Denominators

Discount rates reflecting the asset market and opportunity cost of capital.

Property-Before-Tax Level

Analysis at property asset level, not considering debt or taxes.



INPUTS	
PGI year 1	$ 100,000
Selling costs	5.00%
Going-out cap rate	8.00%
Going-in cap rate	8.00%
r (market approach)	8.60%
g	3.00%

Depreciation	
Cost basis (%)	80%
Cost basis ($)	$ 905,132
Lifetime	27.5
DE	$ 32,914
Ord Tax rate	35%

Loan	
LTV	75.00%
Interest (%)	5.00%
Amortization	25

Note that we put the hea

A. Property-level (Chapter 5)

Operating Cash Flow Items	Year 1	2	3	4	5	6	7
PGI	$ 103,000	$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987
Vacancy	$ 5,150	$ 5,305	$ 5,464	$ 5,628	$ 5,796	$ 5,970	$ 6,149
OpEx	$ 20,600	$ 21,218	$ 21,855	$ 22,510	$ 23,185	$ 23,881	$ 24,597
NOI	$ 77,250	$ 79,568	$ 81,955	$ 84,413	$ 86,946	$ 89,554	$ 92,241
CapEx	$ 15,450	$ 15,914	$ 16,391	$ 16,883	$ 100,000	$ 17,911	$ 18,448
PBTCF	$ 61,800	$ 63,654	$ 65,564	$ 67,531	$ (13,054)	$ 71,643	$ 73,792
DCF:PBTCF	$ 56,906	$ 53,972	$ 51,189	$ 48,549	$ (8,642)	$ 43,671	$ 41,419
Σ (DCF:PBTCF)	$ 1,131,414						

B. After-Debt (Chapter 12)

Operating Cash Flow Items	Year 1	2	3	4	5	6	7
OLB (begin)	$ 848,561	$ 831,064	$ 812,673	$ 793,340	$ 773,018	$ 751,657	$ 729,202
PMT	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527
INT	$ 42,031	$ 41,136	$ 40,195	$ 39,205	$ 38,166	$ 37,073	$ 35,924
AMORT	$ 17,497	$ 18,392	$ 19,333	$ 20,322	$ 21,361	$ 22,454	$ 23,603
OLB (end)	$ 831,064	$ 812,673	$ 793,340	$ 773,018	$ 751,657	$ 729,202	$ 705,599
EBTCF	$ 2,273	$ 4,127	$ 6,036	$ 8,003	$ (72,582)	$ 12,116	$ 14,265

C. After-Tax (Chapter 13)

Operating Cash Flow Items	Year 1	2	3	4	5	6	7
DE	$ 32,914	$ 32,914	$ 32,914	$ 32,914	$ 32,914	$ 32,914	$ 32,914
Taxable Income	$ 2,305	$ 5,518	$ 8,846	$ 12,294	$ 15,866	$ 19,567	$ 23,403
Taxes due	$ 807	$ 1,931	$ 3,096	$ 4,303	$ 5,553	$ 6,849	$ 8,191
PATCF	$ 46,282	$ 47,325	$ 48,399	$ 49,506	$ (31,966)	$ 51,819	$ 53,028
EATCF	$ 1,466	$ 2,195	$ 2,940	$ 3,700	$ (78,135)	$ 5,267	$ 6,074

Cash Flow Components Format

Operating Cash Flow Items	Year 1	2	3	4	5	6	7
NOI	$ 77,250	$ 79,568	$ 81,955	$ 84,413	$ 86,946	$ 89,554	$ 92,241
- CapEx	$ 15,450	$ 15,914	$ 16,391	$ 16,883	$ 100,000	$ 17,911	$ 18,448
PBTCF	$ 61,800	$ 63,654	$ 65,564	$ 67,531	$ (13,054)	$ 71,643	$ 73,792
- PMT	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527	$ 59,527
EBTCF	$ 2,273	$ 4,127	$ 6,036	$ 8,003	$ (72,582)	$ 12,116	$ 14,265
- Tax on NOI	$ 27,038	$ 27,849	$ 28,684	$ 29,545	$ 30,431	$ 31,344	$ 32,284
+ Tax on DE (DTS)	$ 11,520	$ 11,520	$ 11,520	$ 11,520	$ 11,520	$ 11,520	$ 11,520
+ Tax on INT (ITS)	$ 14,711	$ 14,397	$ 14,068	$ 13,722	$ 13,358	$ 12,976	$ 12,573
EATCF	$ 1,466	$ 2,195	$ 2,940	$ 3,700	$ (78,135)	$ 5,267	$ 6,074

Capital Markets Overview

Public Markets

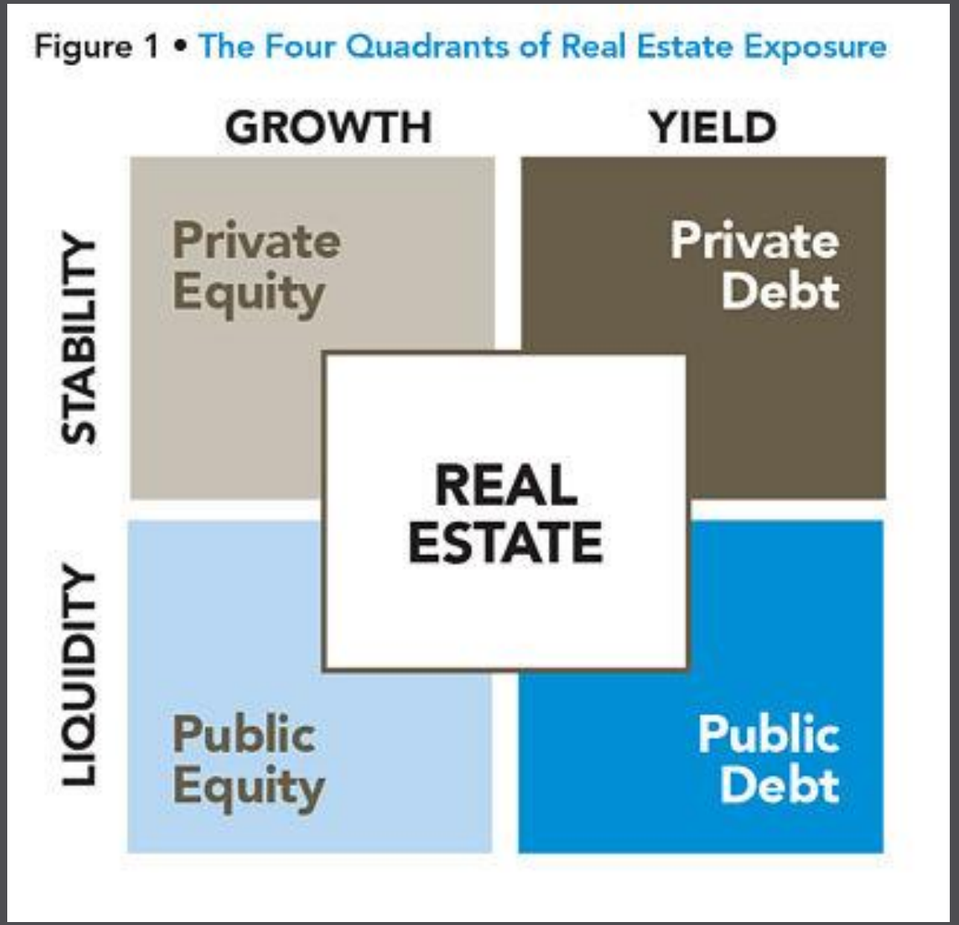
Homogeneous units traded on exchanges with many participants. High liquidity and price transparency.

Private Markets

Assets traded in private transactions between individual buyers and sellers. Lower liquidity and transparency.

Capital Market Quadrants

	Public	Private
Equity	Stocks, REITs, Mutual funds	Real estate, Equity funds
Debt	Bonds, MBS, Money instruments	Bank loans, Mortgages, Venture capital



Opportunity Cost of Capital (OCC)

Risk-Free Rate

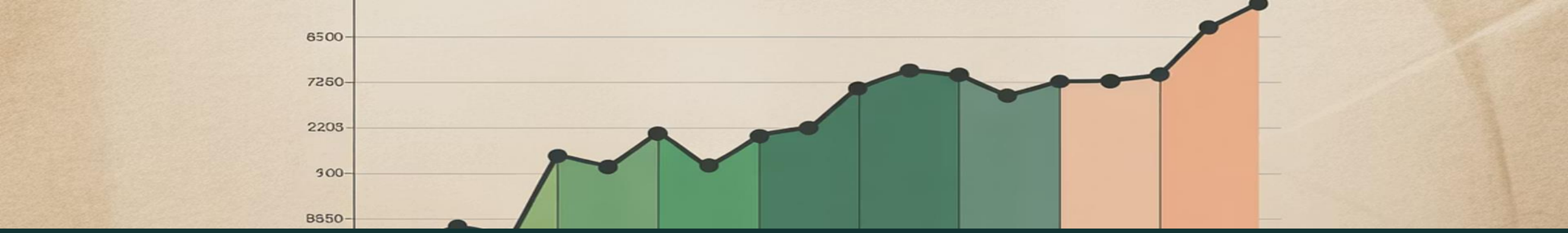
Based on government securities yields.

Risk Premium

Additional return for taking investment risk.

Total Return

Expected return investors require for similar-risk investments.



Computing the Risk-Free Rate

Start with 10-Year Government Bond Yield

Reflects long-term investment horizon of real estate.

Subtract Yield Curve Effect

Typically, 15% to account for interest rate risk premium.

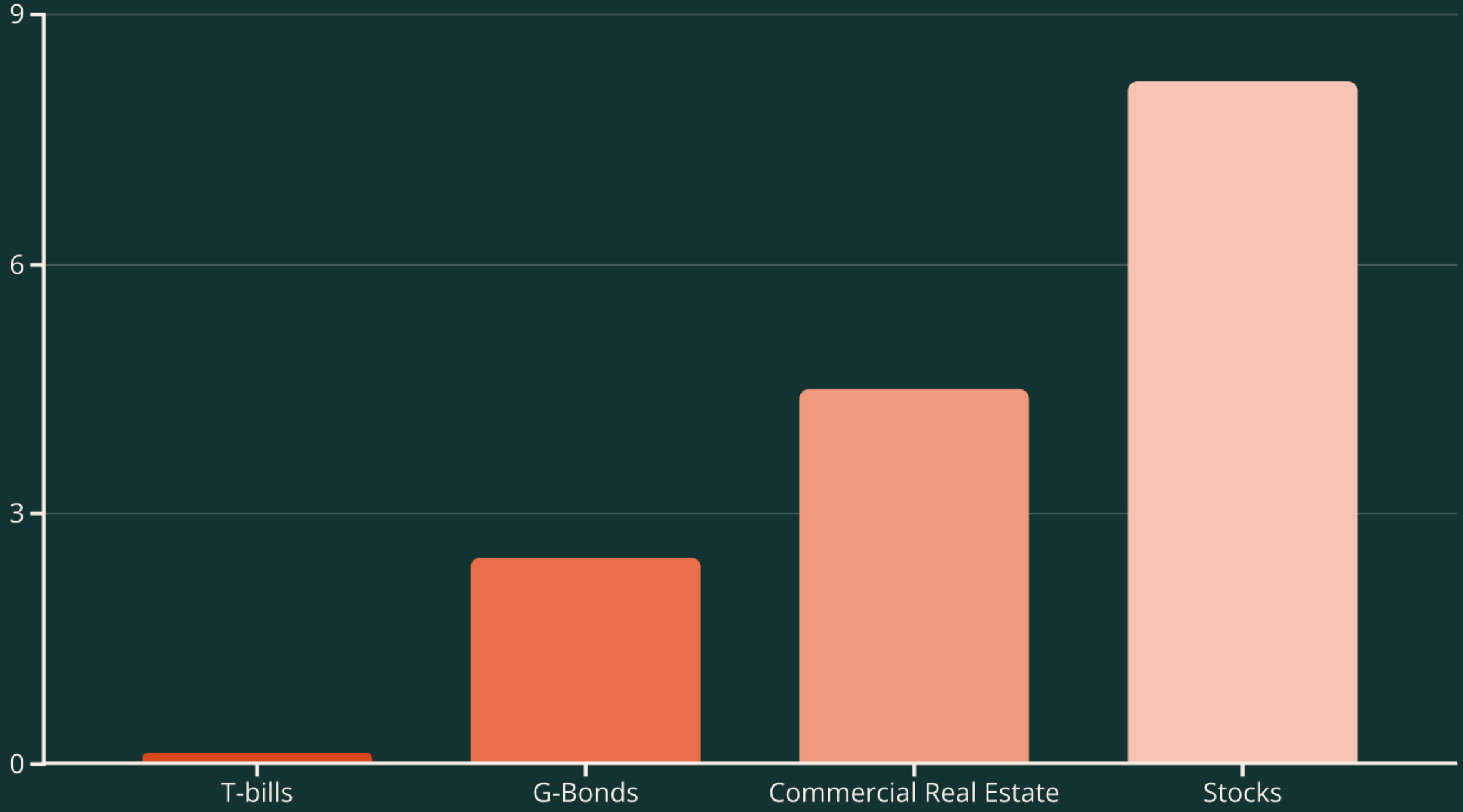
Result: Long-Term Risk-Free Rate

Represents expected average future short-term yields.

Method #1: Structural Approach to OCC

3%	4.5%	7.5%
Risk-Free Rate	Risk Premium	Total OCC
10-year bond yield minus 1.5% yield curve effect	Historical premium institutional real estate	Expected return for typical commercial property

Historical Risk Premiums (1970-2022)



Method #2: Market Approach to OCC

Observe Cap Rates

Current transaction cap rates in relevant market

Adjust for CapEx

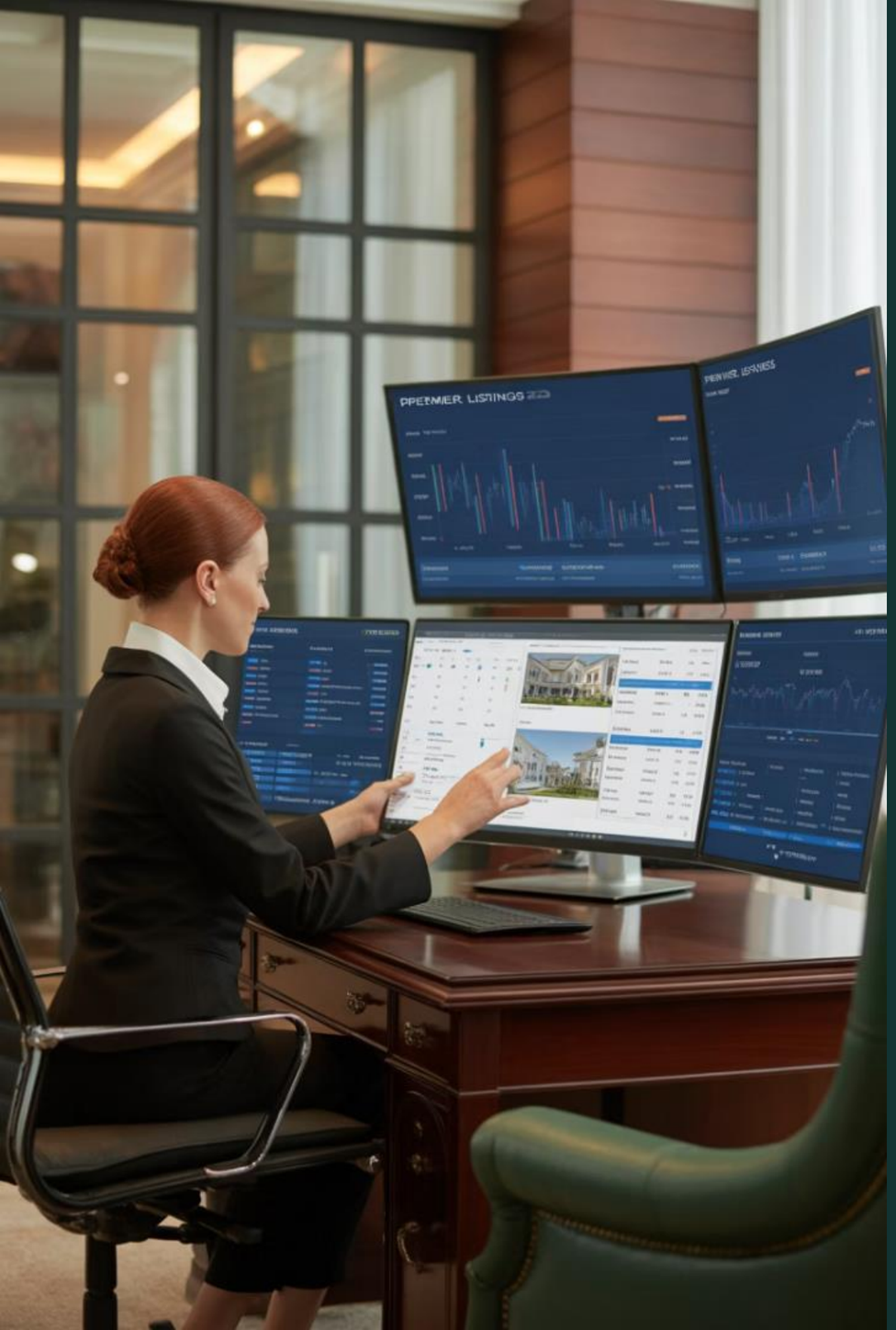
Multiply by 0.7 to reflect actual cash flow yield

Calculate OCC

$E[r] \approx 0.7 \times (\text{Cap rate}) + E[g]$

Add Growth Rate

Expected rental growth minus depreciation



Comparable Cap Rate Analysis

Find Similar Properties

Identify 3-10 comparable properties that recently sold in your target market.

Adjust for Differences

Account for variations in location, size, age, and market timing.

Calculate Average

Determine weighted average cap rate based on similarity to target property.

Apply Formula

Use adjusted cap rate in the market approach formula to find OCC.

Double-Checking OCC Estimates

Structural Approach

Risk-free rate + Risk premium

Reflects what OCC "should be" based on fundamental theory

Market Approach

Adjusted cap rate + Growth rate

Reflects current market conditions and property specifics

When approaches disagree, it may signal market overvaluation or undervaluation. This can provide valuable investment timing insights.

Alternative OCC Estimation Methods

Investor Surveys

Direct feedback on expected returns from market participants.

Corporate Bond Yields

Useful for valuing long-term leases with corporate tenants.

Historical Performance

Long-term actual returns for similar properties.

Property Type Risk Variations

Risk premiums vary by property type, size, and operational status. For example, hotels and specialty properties typically command higher risk premiums than core property types.

Institutional vs. Non-Institutional Properties

Trophy Assets

Lowest risk premium

Institutional Core

Moderate risk premium

Value-Add Properties

Higher risk premium

Development Projects

Highest risk premium

Going-Out Cap Rate Considerations

Property Age

Younger properties experience more cap rate creep.

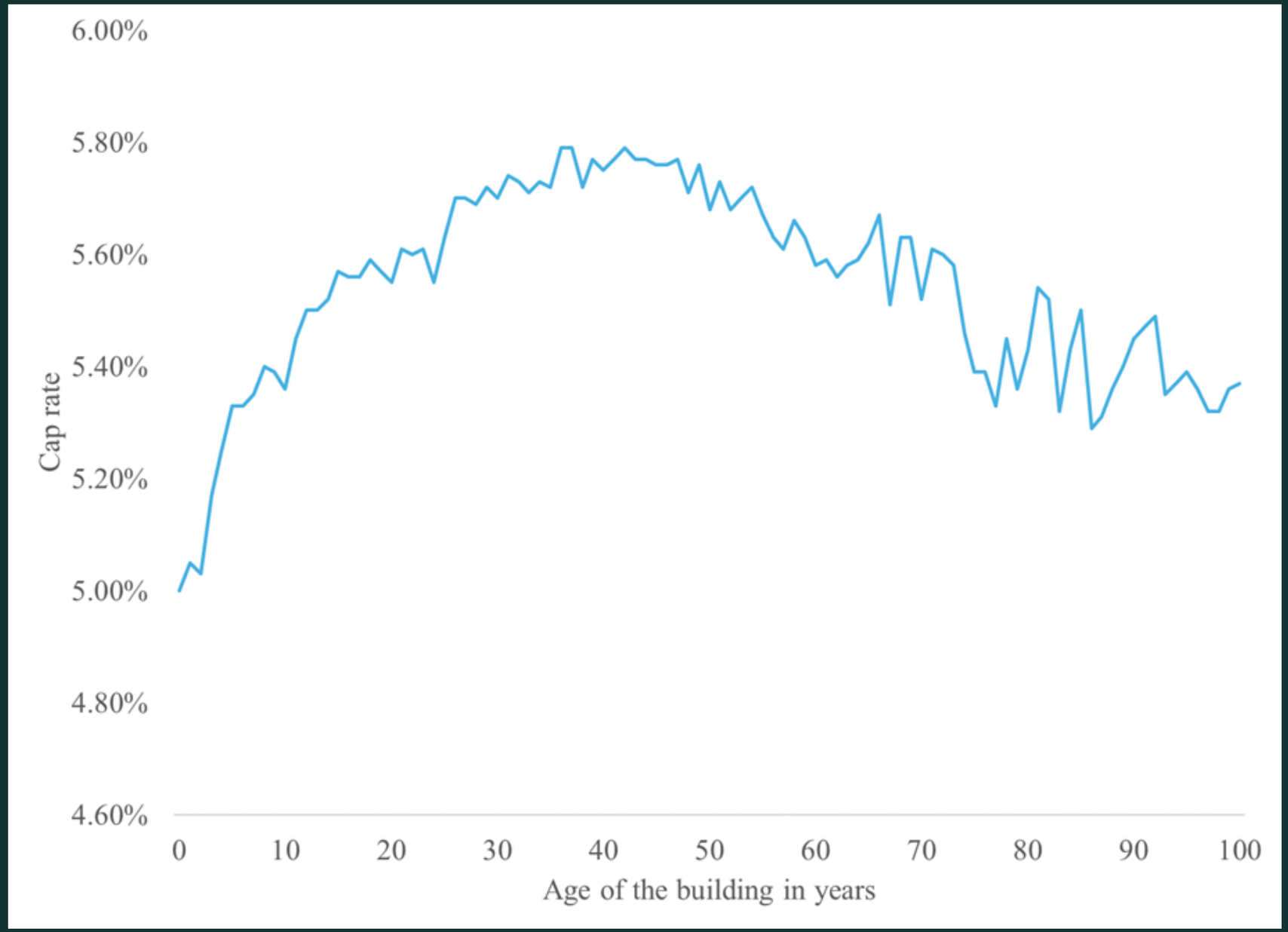
Growth Expectations

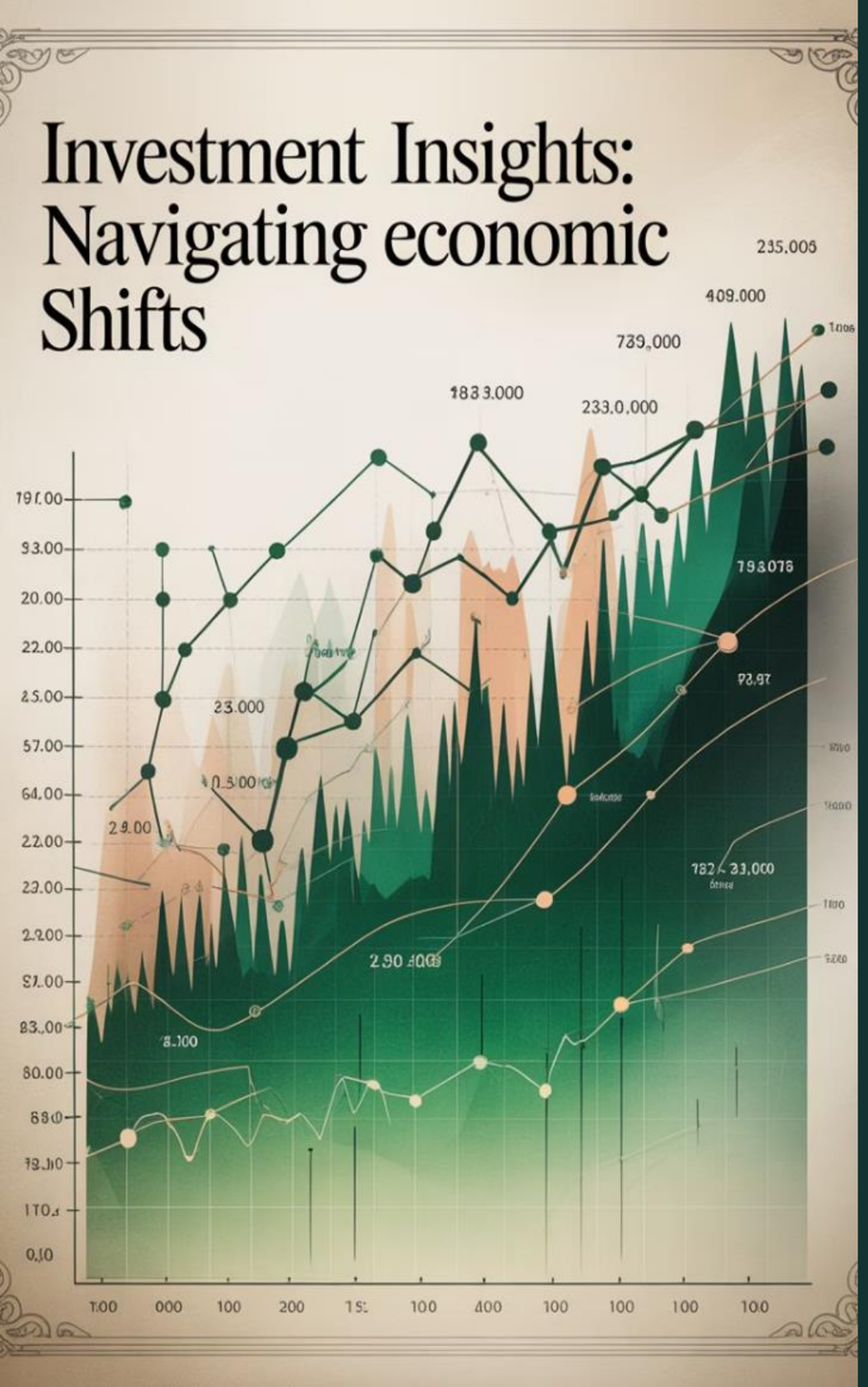
Changes in rental growth projections affect exit cap rate.

Risk Premium Changes

Older properties typically have higher risk premiums.

Cap Rate Age Profile: In general cap rates increase with building age except for Some classic or iconic buildings in prime locations.





Inflation Impact on Discount Rates

Nominal Risk-Free Rate

Increases with inflation (real rate + inflation)

Risk Premium

May decrease slightly as real estate hedges inflation

Rental Growth

Often increases with inflation, offsetting discount rate changes

Cap Rates

Remain relatively stable as inflation effects mostly cancel out

Common DCF Mistakes: GIGO Problems

1 **Intentionally Misleading Assumptions**

Using unrealistic inputs to make a property look more valuable.

2 **Excessive Laziness**

Relying on conventional wisdom rather than property-specific analysis.

3 **Ignoring Market Cycles**

Failing to consider cyclical tendencies in space and asset markets.

4 **Misapplying Underwriting Haircuts**

Using conservative assumptions inconsistently or inappropriately.

Underwriting Haircuts vs. GIGO

Underwriting Haircuts

Deliberate conservative assumptions to protect against downside risk.

- Intentionally conservative
- Risk management tool
- Common in lending

GIGO Problems

Poor quality inputs that lead to unreliable or misleading valuations.

- Unrealistic assumptions
- Lack of rigor
- Often self-deceptive

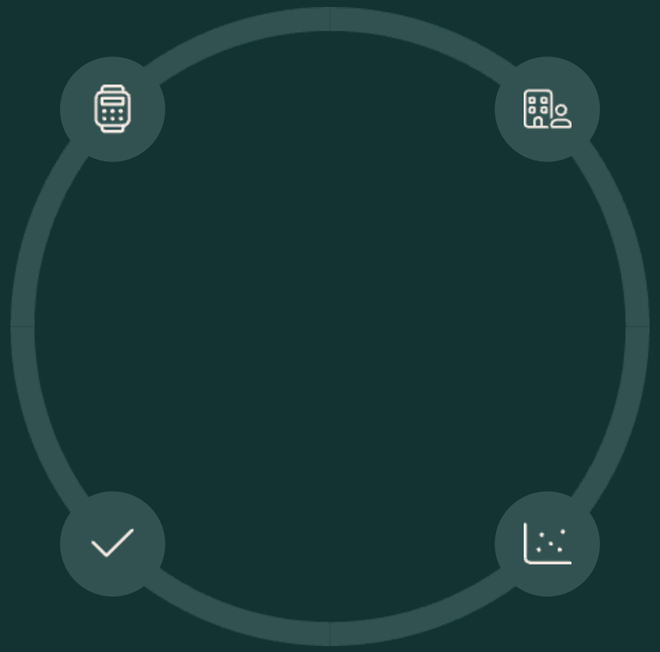
Key Takeaways

Multiple Methods

Use both structural and market approaches to estimate OCC.

Quality Inputs

Ensure realistic, unbiased assumptions in all DCF components.



Property Specifics

Adjust for property type, age, and market conditions.

Market Cycles

Consider where we are in space and asset market cycles.