Risk & Return in Real Estate: And What to Do About It…

Professor David Geltner

Massachusetts Institute of Technology

Center for Real Estate

Prepared for

PROFIMEX®

בית ההשקעות לנדל"ן העולם®

Private Equity Real Estate Conference

Tel Aviv, Israel

January 29, 2008

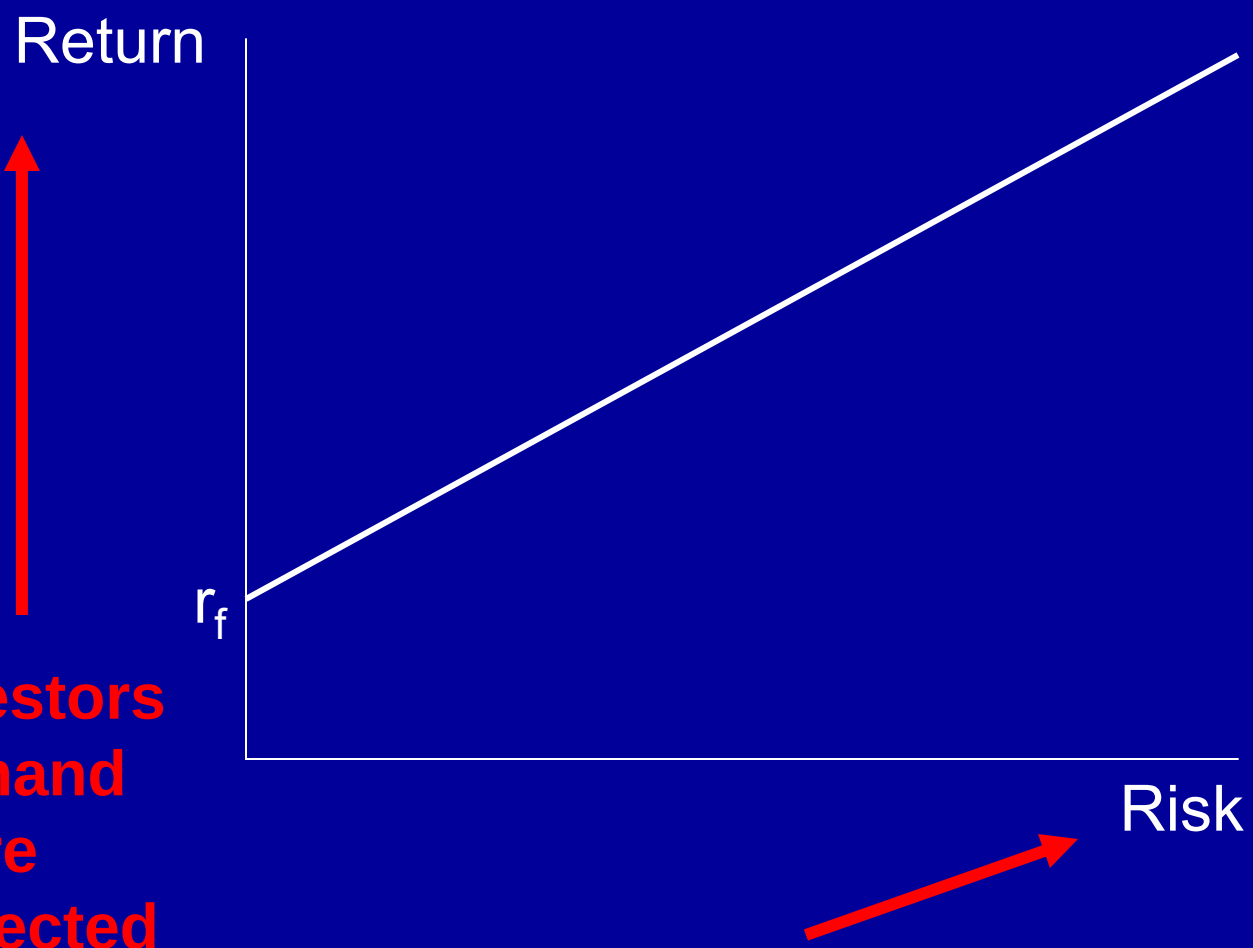
MIT CENTER FOR REAL ESTATE

What do investors care about? …

Risk & Return

Fear & Greed

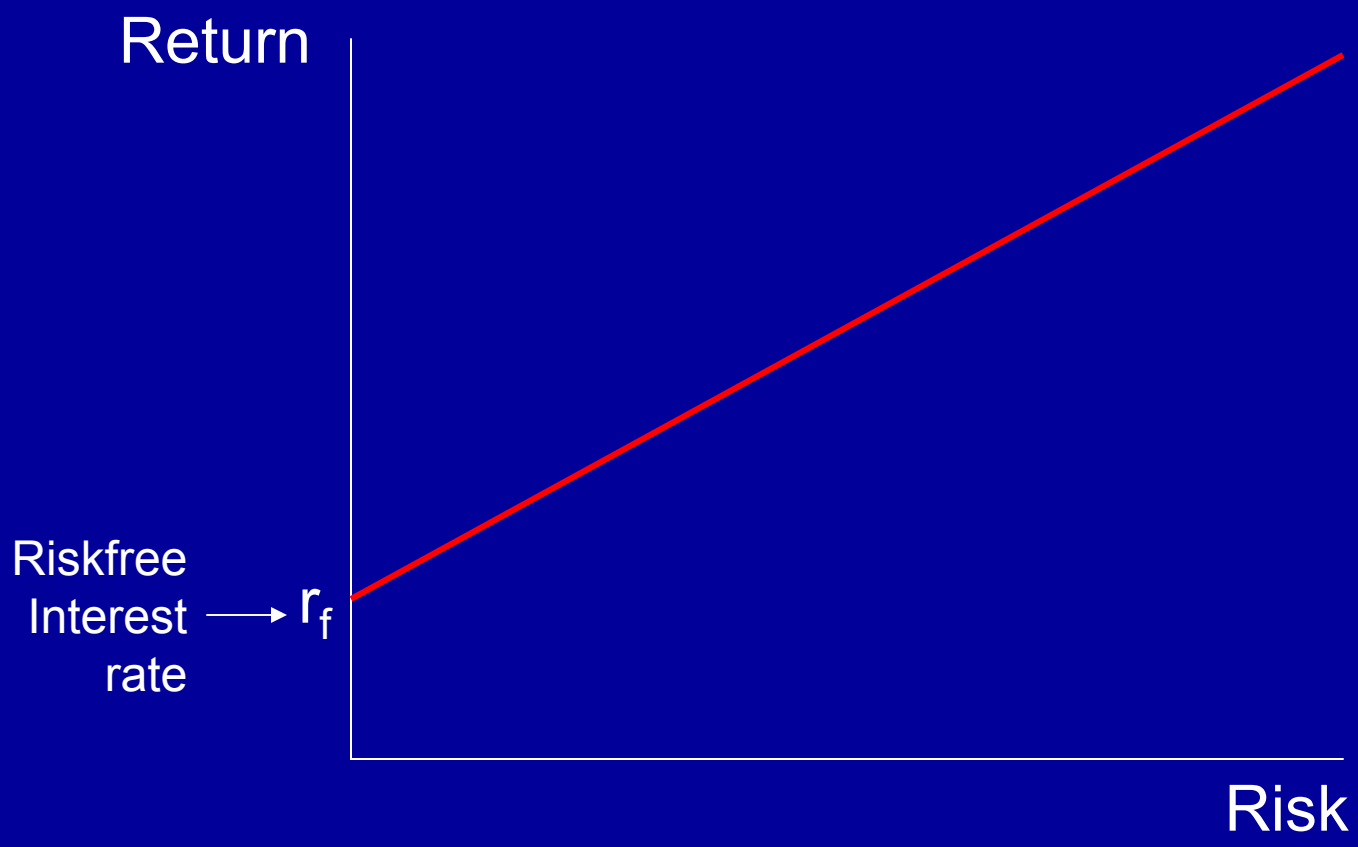
What do investors care about? …



Investors demand more expected return, when there is more risk.

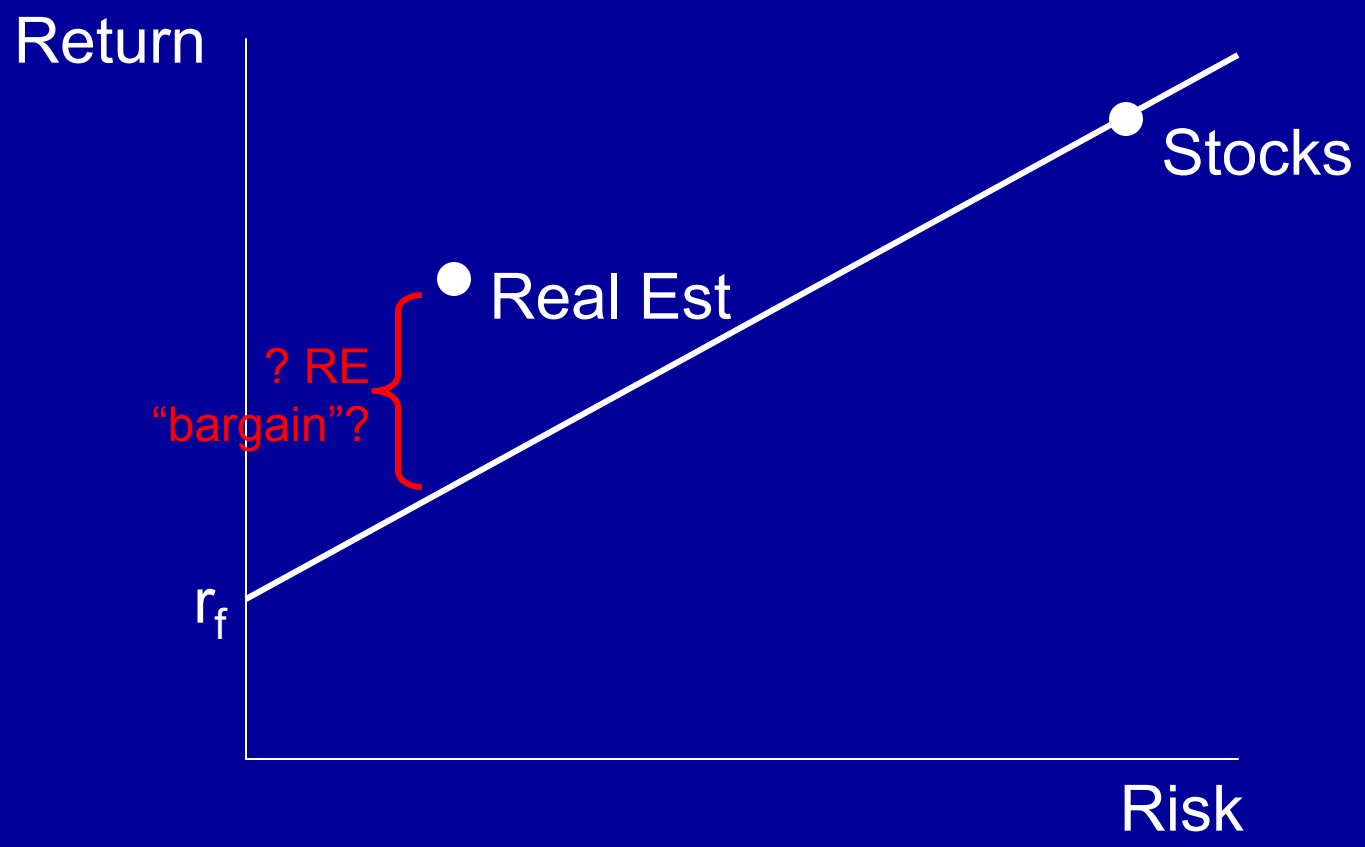
Econ theory says:

Assets' avg returns & risk should lie on this line…

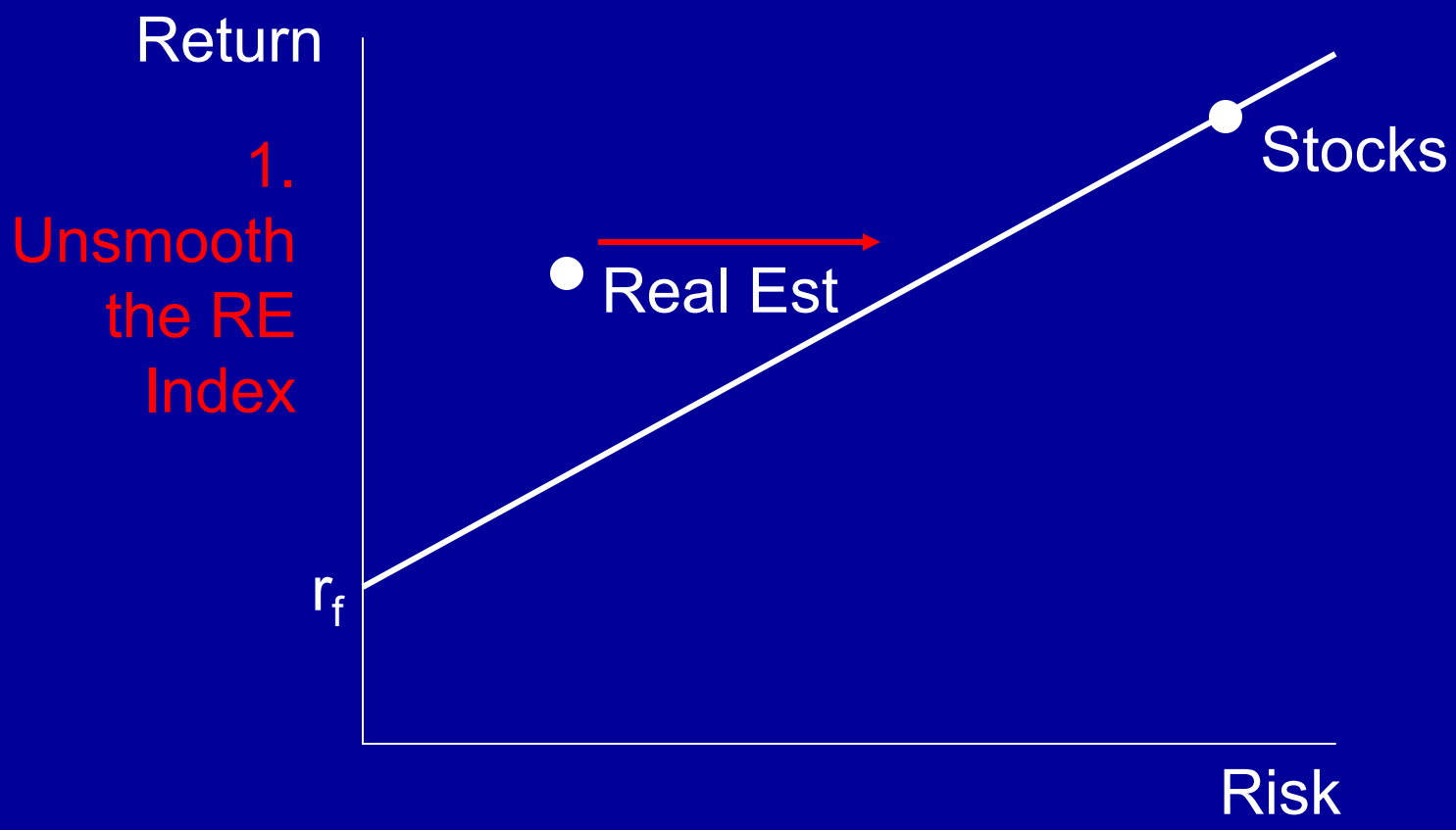


For example…

The Real Estate “Risk Premium Puzzle”…



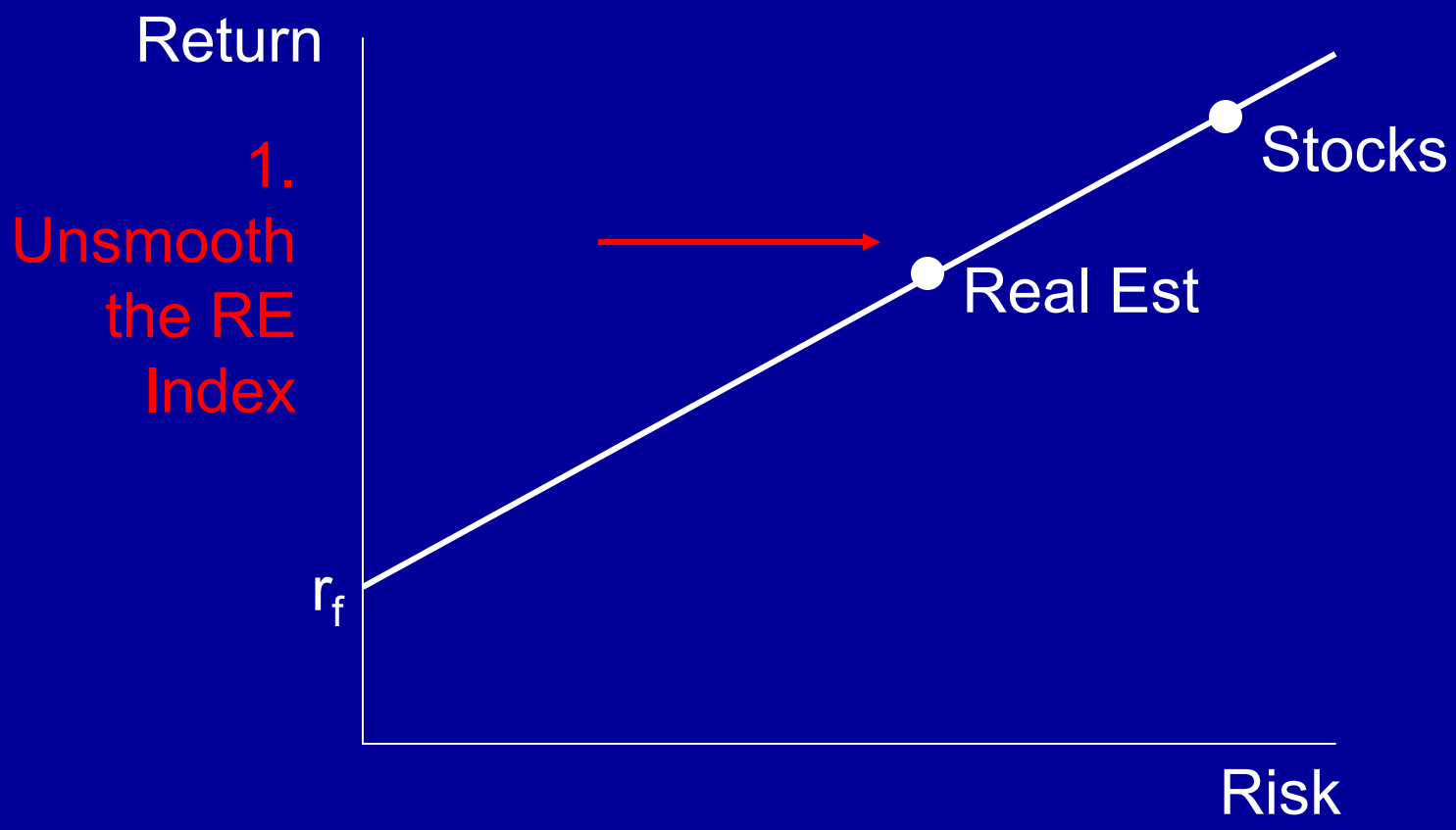
Solve the "Puzzle":



1. Unsmooth the RE Index

2. Define risk ("beta") wrt Natl Wealth Portfolio (NWP)

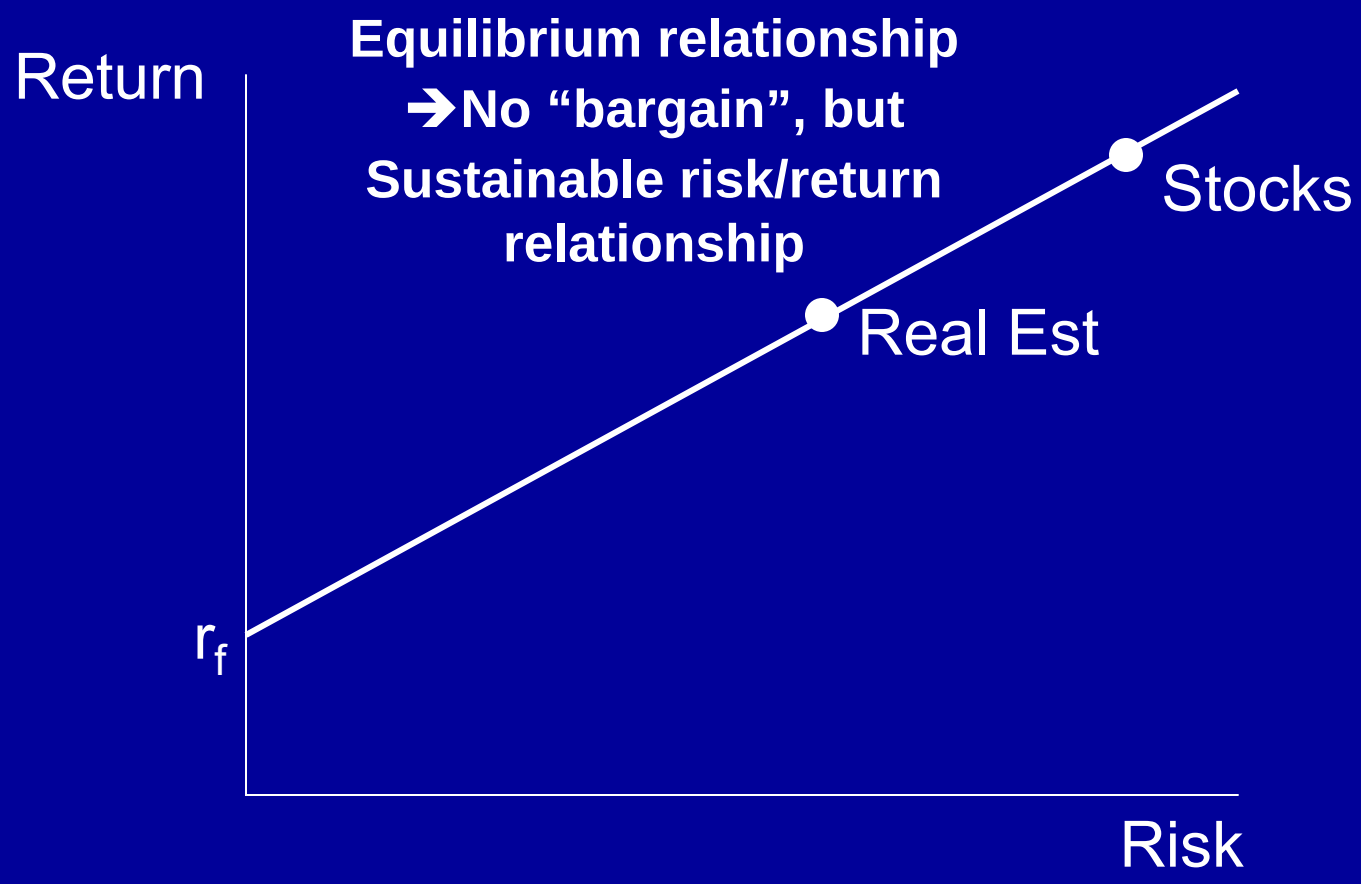
Solve the "Puzzle":



1. Unsmooth the RE Index

2. Define risk ("beta") wrt Natl Wealth Portfolio (NWP)

Solve the "Puzzle":



Econ theory CAPM works *at broad asset class level*

Applying the Basic CAPM *ACROSS* asset classes

➔ RE equilibr RP ≈ 300 bps.

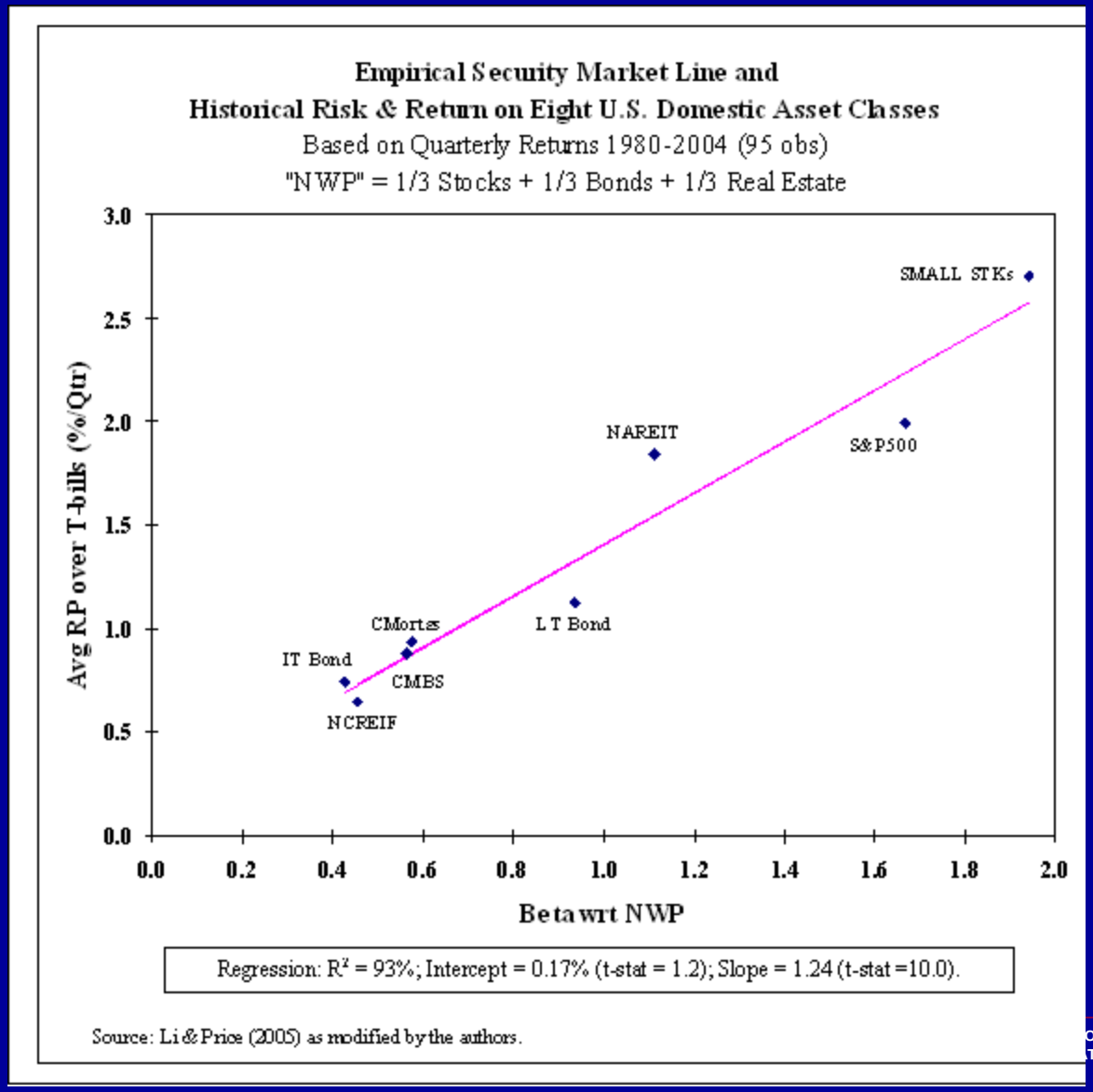
If LR r_f ≈ 4%,

➔RE equilibr E[r] = 7%.

If capital retn ≈ 2%, & 1% CapEx, then

➔ cap rate ≈ 6%.

Implications for current pricing?...



Applying the Basic CAPM *ACROSS* asset classes

➔ RE equilibr RP ≈ 300 bps.

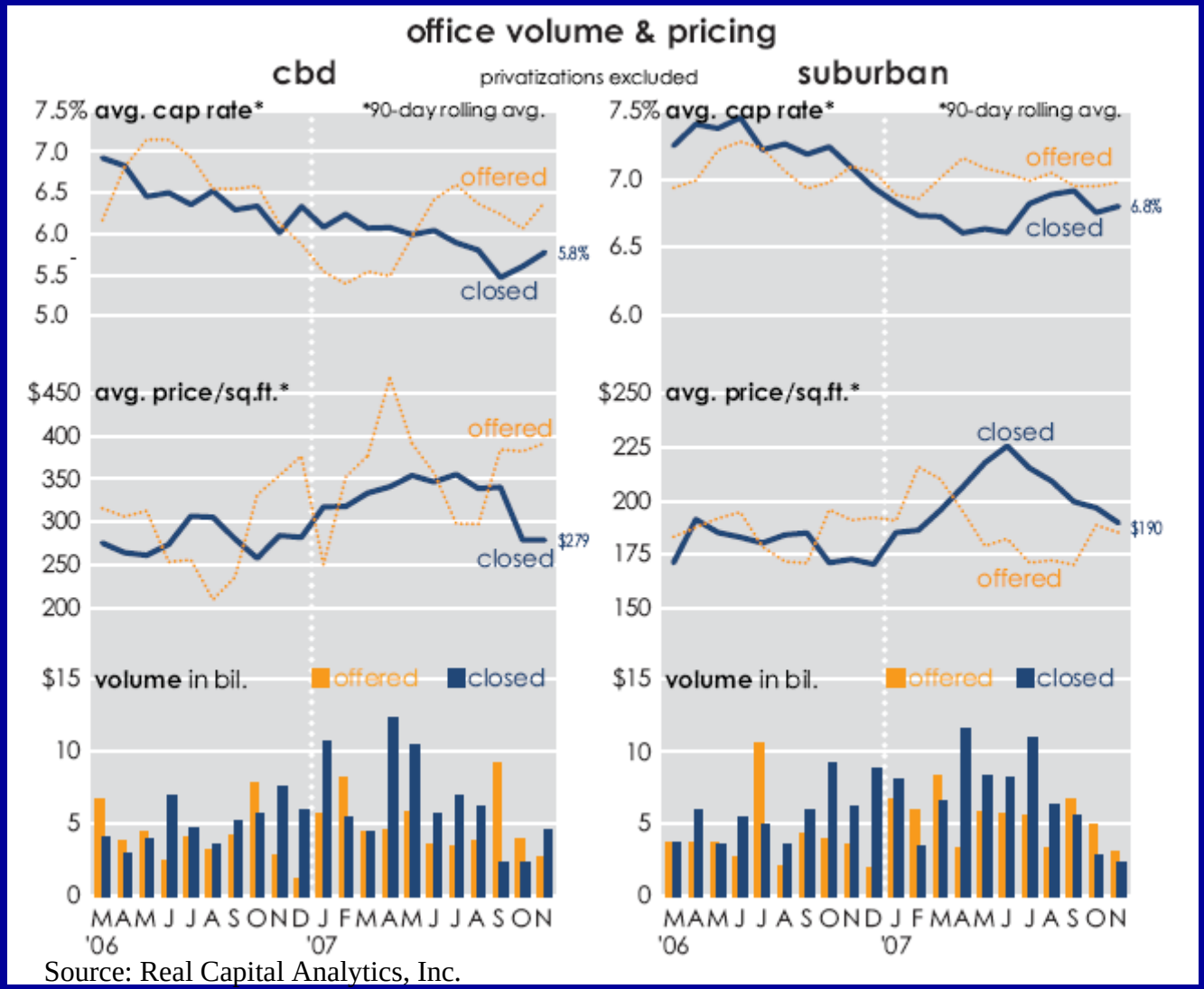
If LR r_f ≈ 4%,

➔RE equilibr E[r] = 7%.

If capital retn ≈ 2%, & 1% CapEx, then

➔ cap rate ≈ 6%.

Implications for current pricing?...



Source: Real Capital Analytics, Inc.

Applying the Basic CAPM *ACROSS* asset classes

➔ RE equilibr RP ≈ 300 bps.

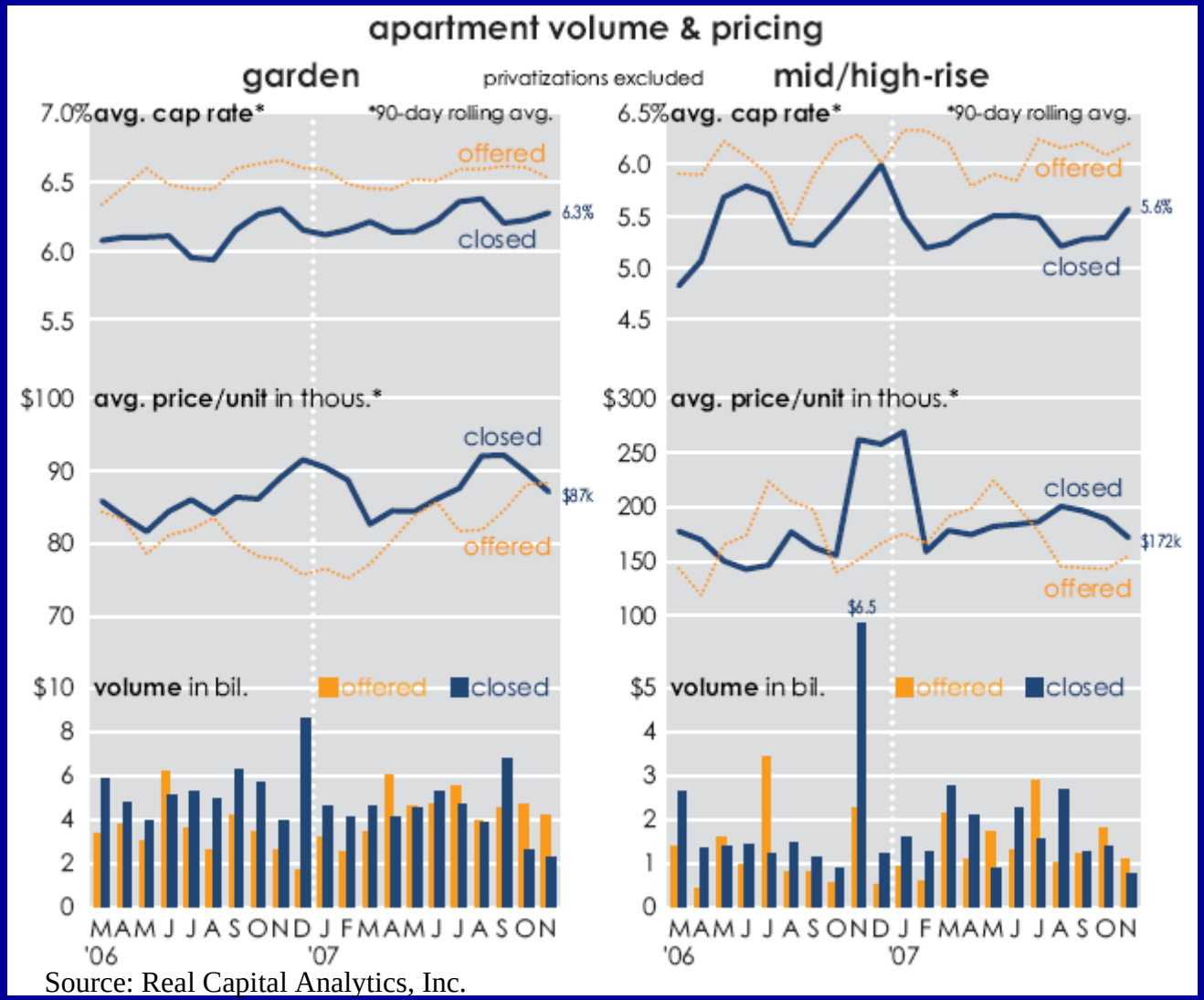
If LR r_f ≈ 4%,

➔RE equilibr E[r] = 7%.

If capital retn ≈ 2%, & 1% CapEx, then

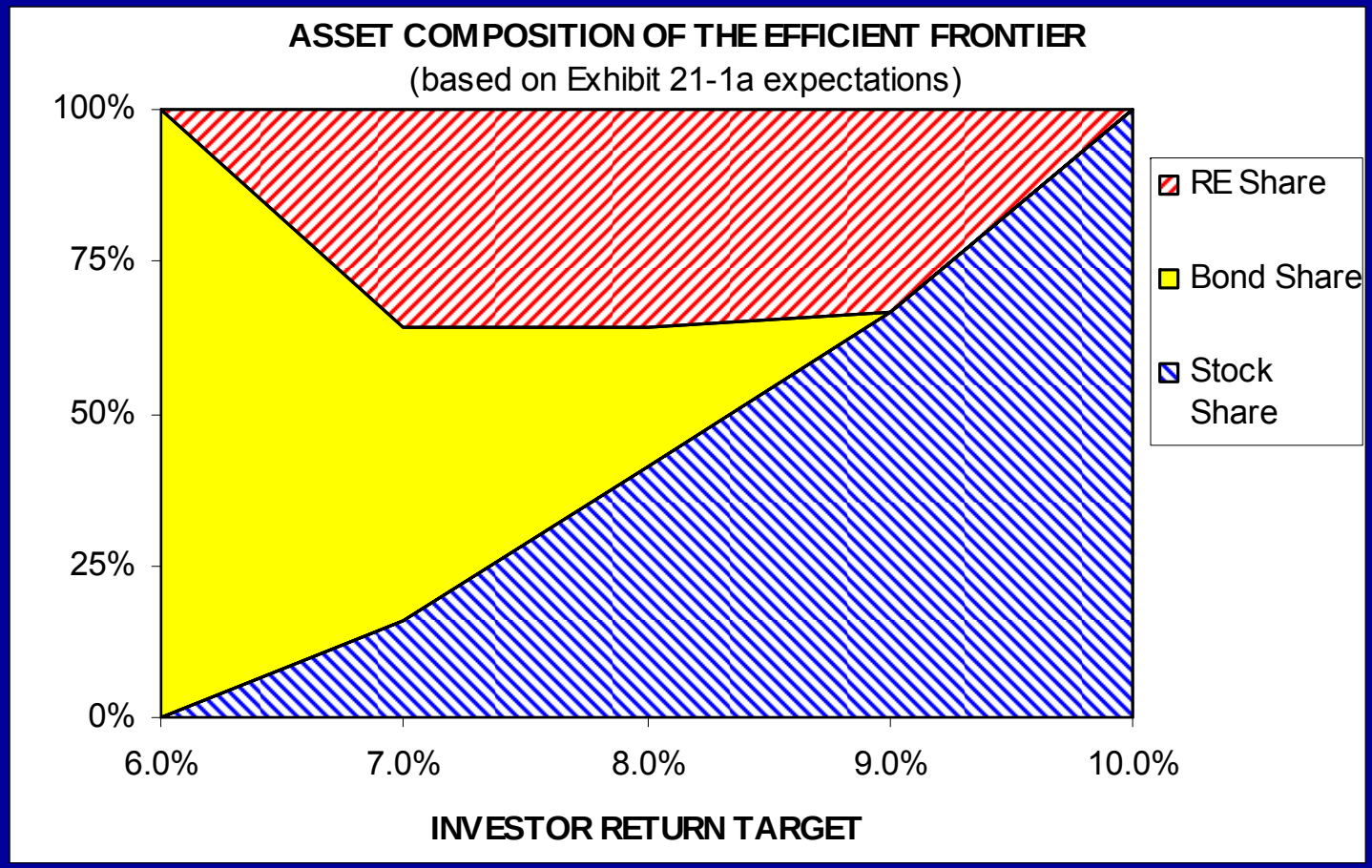
➔ cap rate ≈ 6%.

Implications for current pricing?...

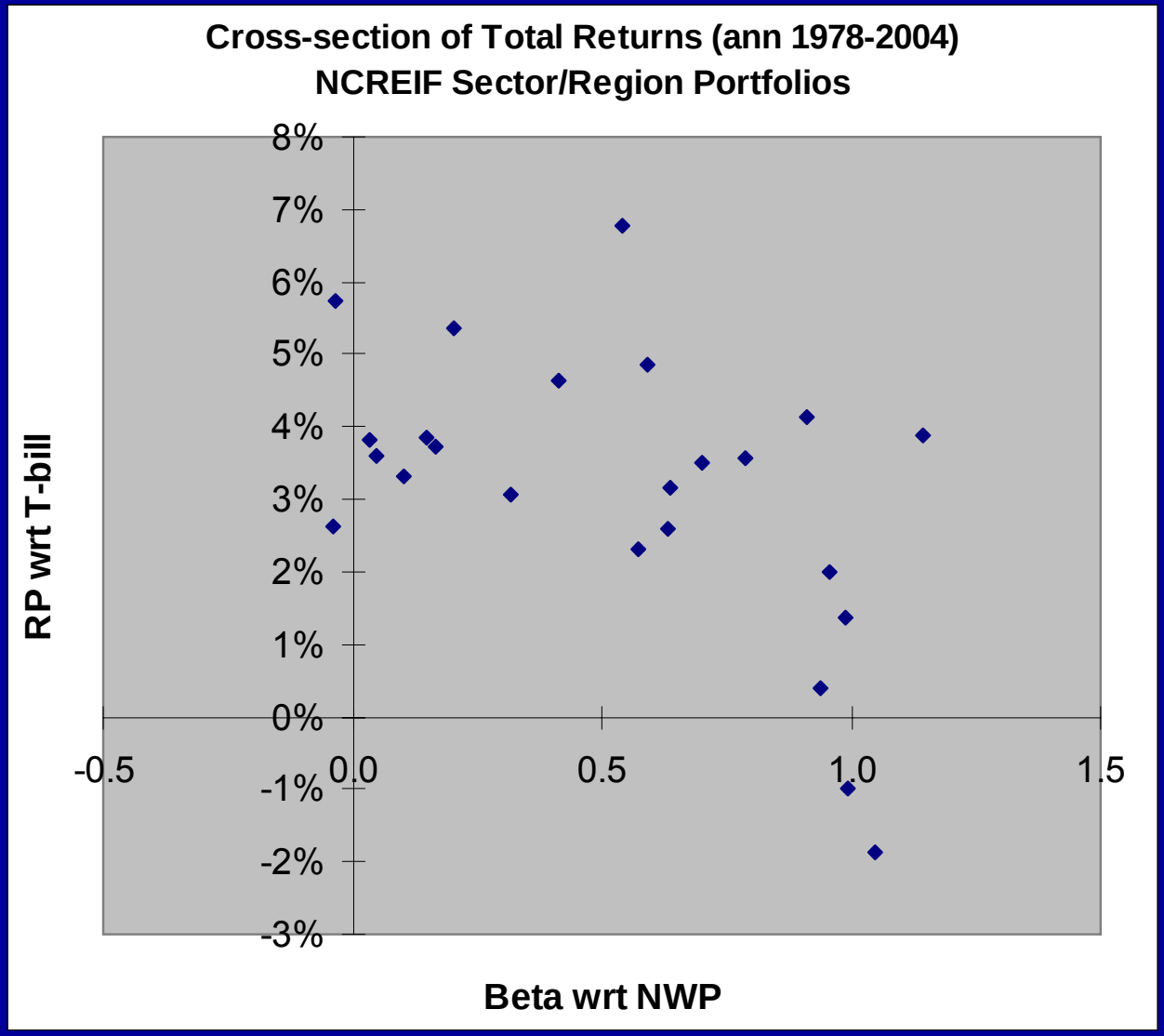


Source: Real Capital Analytics, Inc.

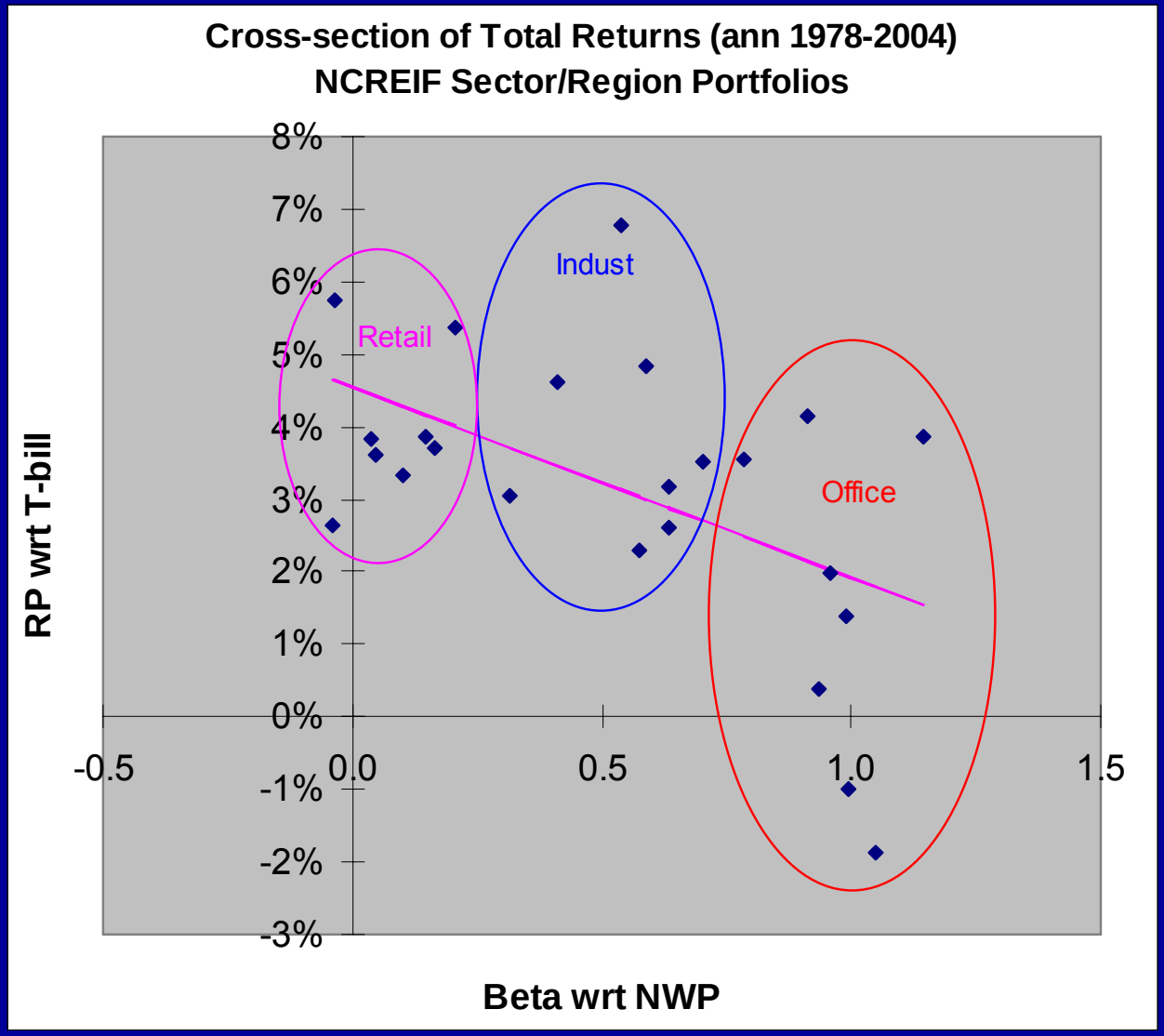
CAPM-based (equilibrium) risk & return expectations give substantial RE portfolio allocation…



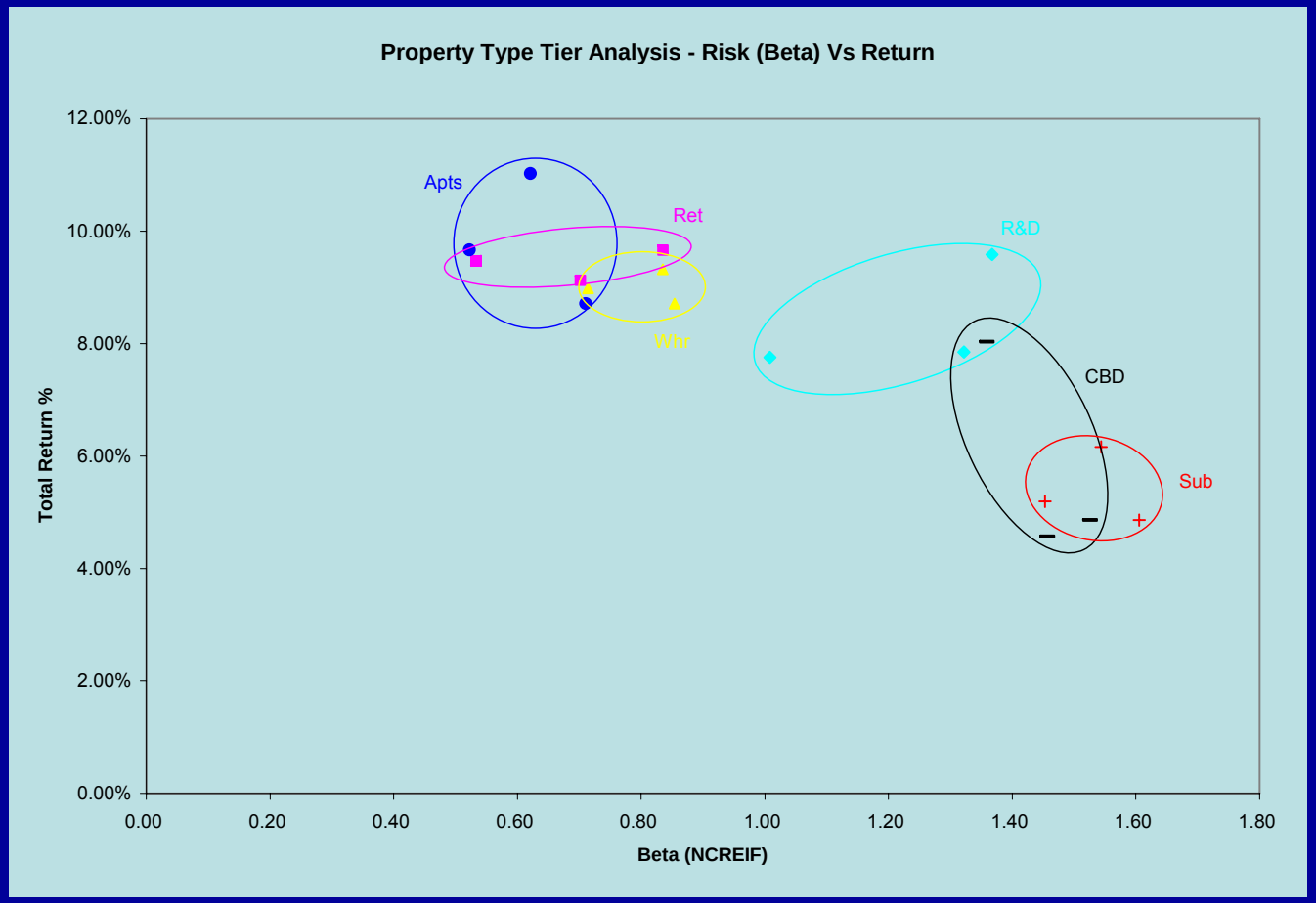
But CAPM doesn't work *within* the real estate asset class



Curiously, clustering by sector…



Risk vs. Return



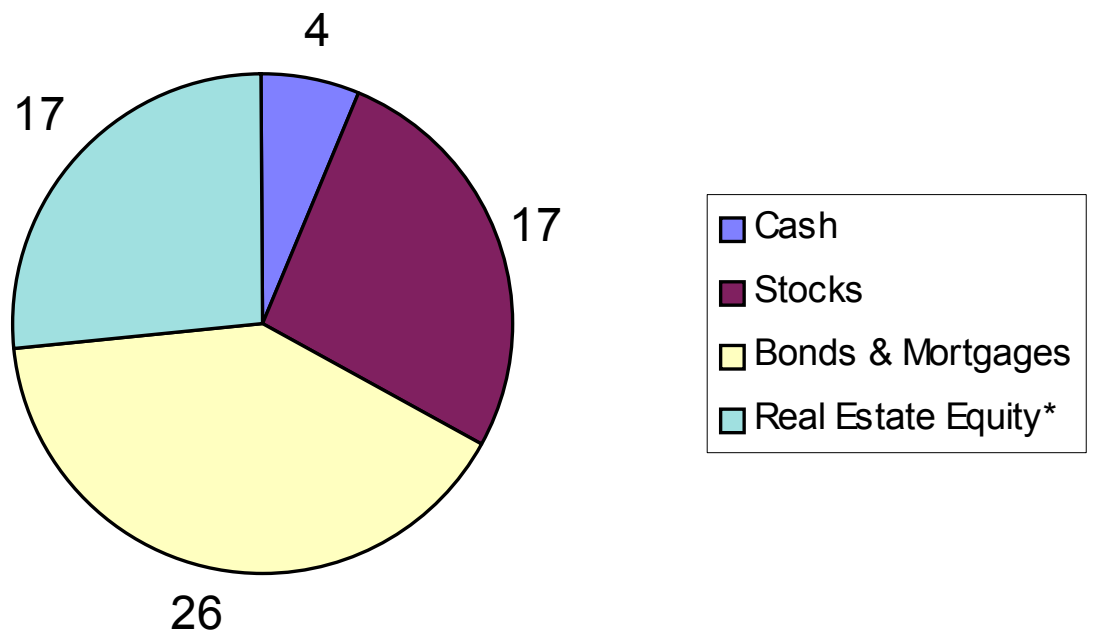
- Portfolios with *higher* Market Beta have *lower* historic total returns – inconsistent with conventional theory (opposite to stock market).
- Clear aggregation with property type - possible strong market pricing factor.
- Market obtained a premium for investing in Apartments, Retail and Warehouse.

The "take-away" from the *"within real estate"* studies…

- Pai thesis, others: Moodys, Torto-Wheaton, Rowe MSRED (Wheaton),…
- All suggest lack of rational pricing of risk *within* R.E. asset class;
- Or else risk preferences that may differ from those of some investors.
- ***What can we do about it? . . .***

Real estate is the largest category of physical assets (over 1/3 of national wealth) for which no **derivatives** are traded (until now…)

Exhibit 7-5: Approximate Aggregate Value of Asset Classes, USA early 2000s ($Trillion)



*Excludes value in mortgages and corporate real estate.

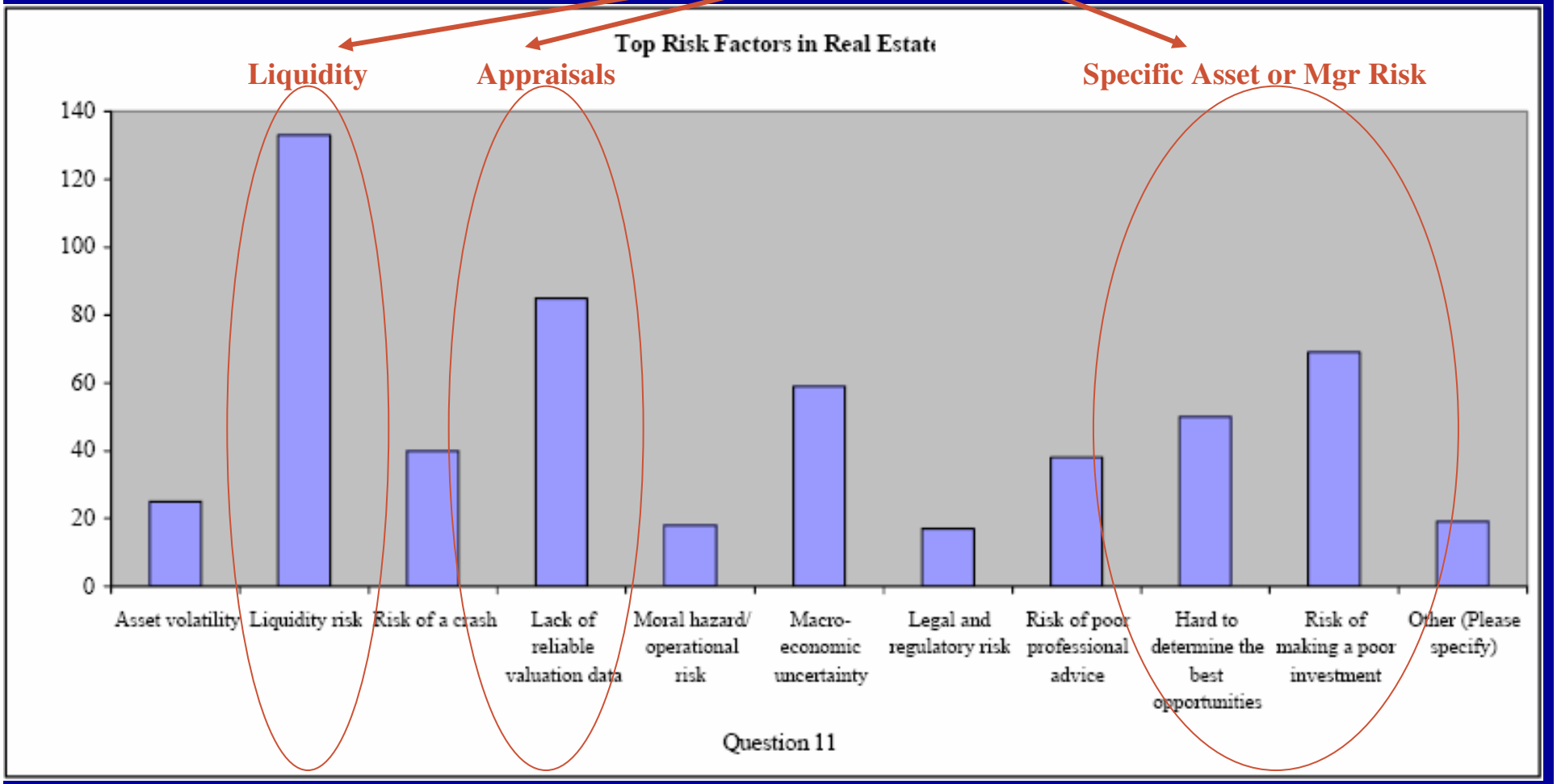
Source: Geltner, Miller, Clayton, Eichholtz, 2nd Ed © 2007

Trading has started on:

- IPD/UK
- Case-Shiller CME
- CMBX
- NCREIF

MIT CENTER FOR REAL ESTATE

Derivatives Can Address Major Concerns of Institutional Investors About R.E.



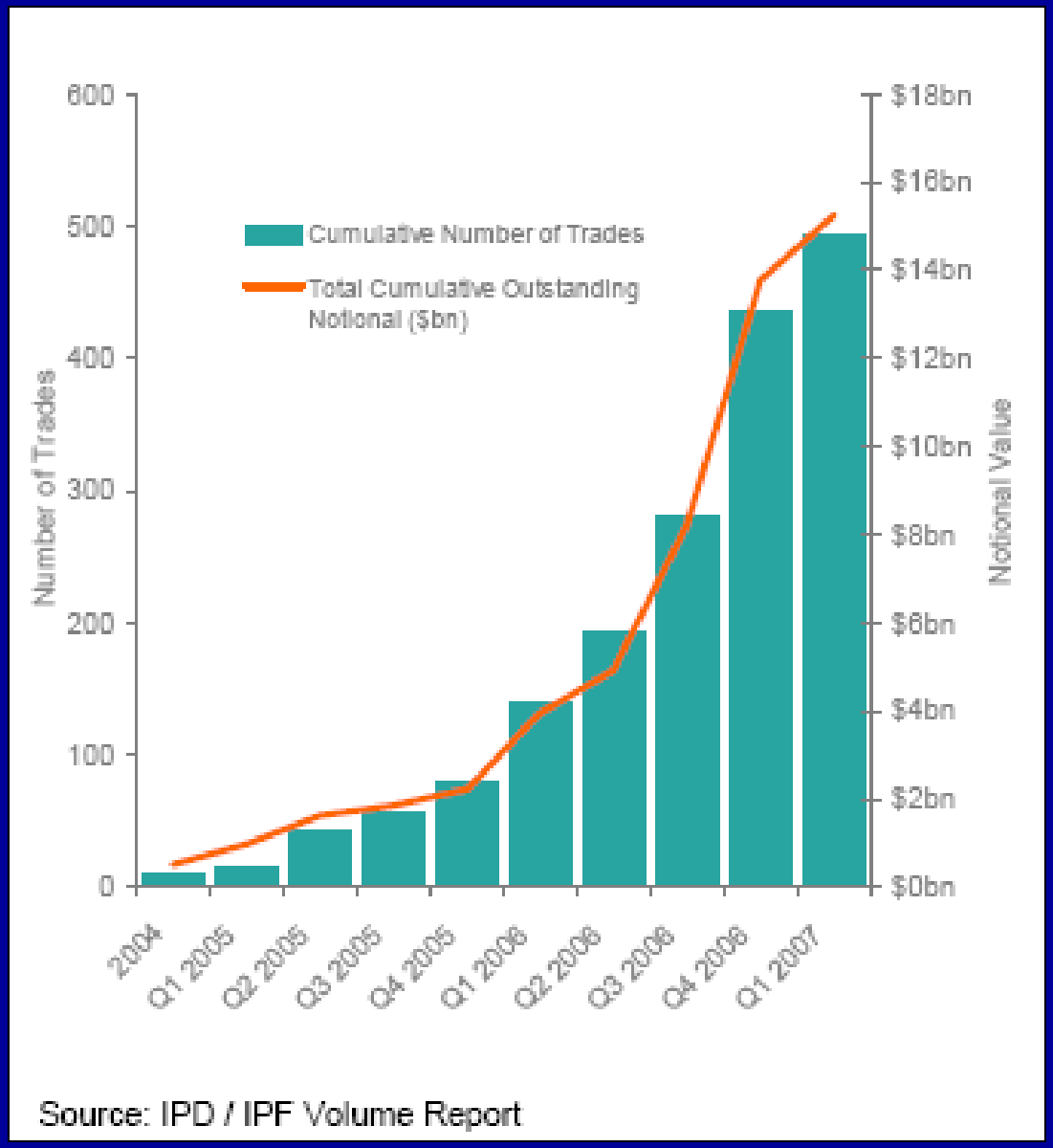
Number of responses to question: *"What are the top three risk factors in real estate investment?"*

Source: Dhar & Goetzmann 2004 survey of U.S. pension funds for PREA.

Index-based derivatives allow:

- Synthetic investment in diversified real estate ("beta"), with:
- Low transactions costs, low mgt costs, improved liquidity
- Hedging of R.E. risk (RE "mkt insurance") using *"short"* positions, to:
- Reduce risk (beta) exposure, "harvest alpha":
- Profit from beating the RE mkt even when RE mkt is down (profit from specialized expertise)

R.E. Derivatives Have "Taken Off" in the U.K.



Source: IPD / IPF Volume Report

In 2 years

British RE Derivs Mkt has grown to

£3B in 07Q1,

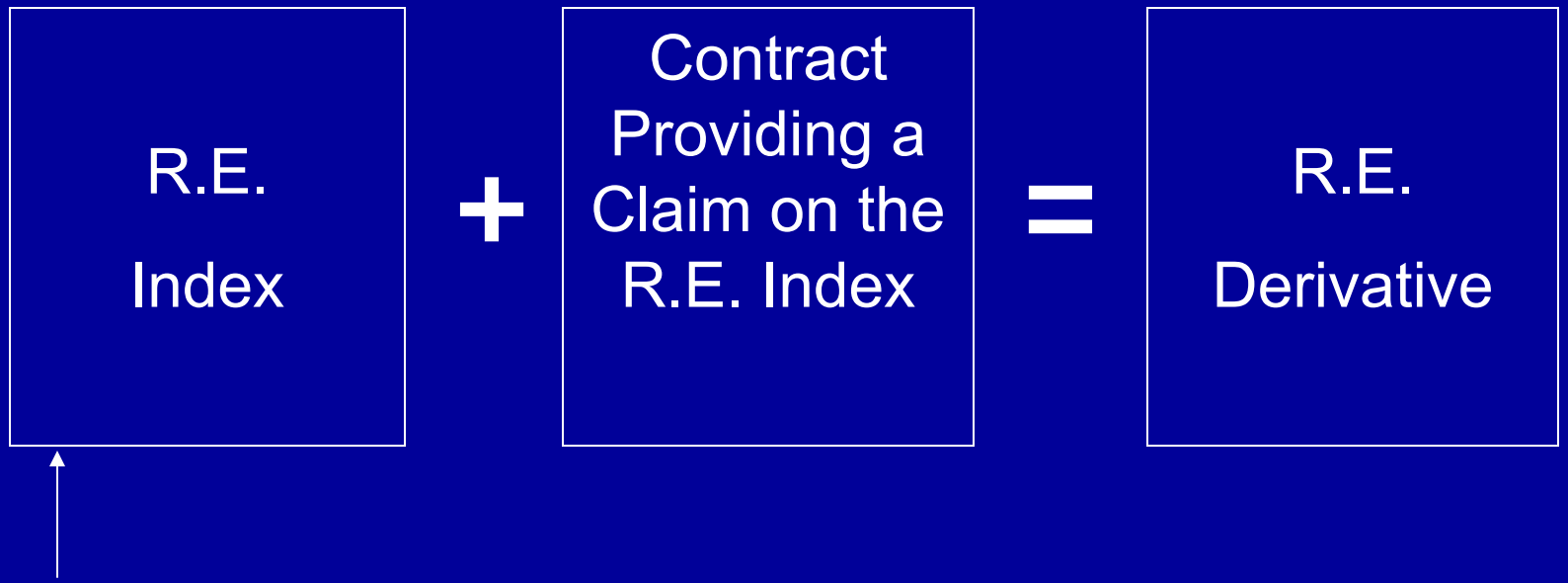
vs

approx £8B in UK Property Mkt.

Over 1/3 the volume in the property market.

MIT CENTER FOR REAL ESTATE

How to Construct a Real Estate Derivative…

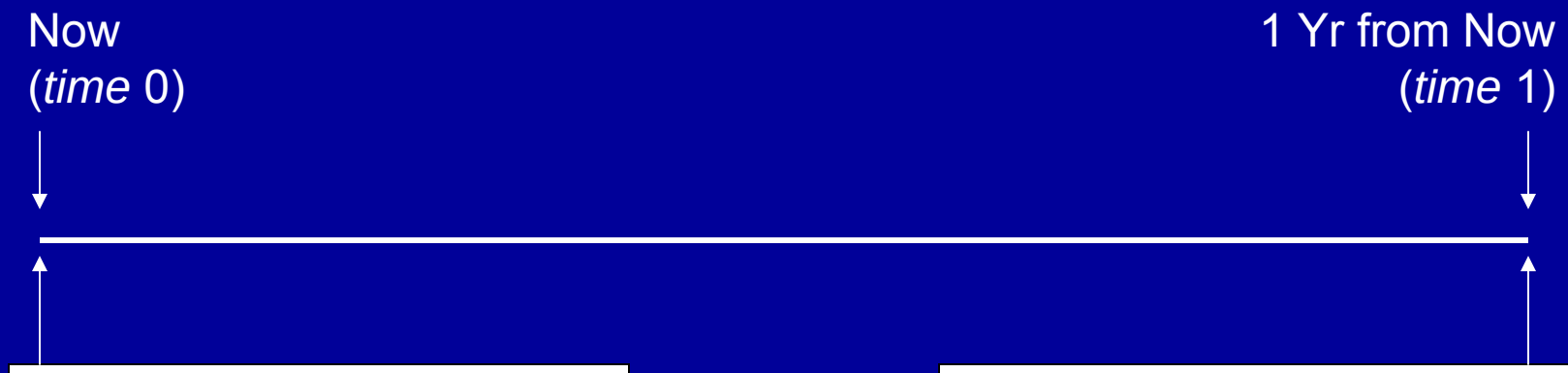


What is a forward…

Forwards

Example: 1-year Forward Contract:

Timeline:

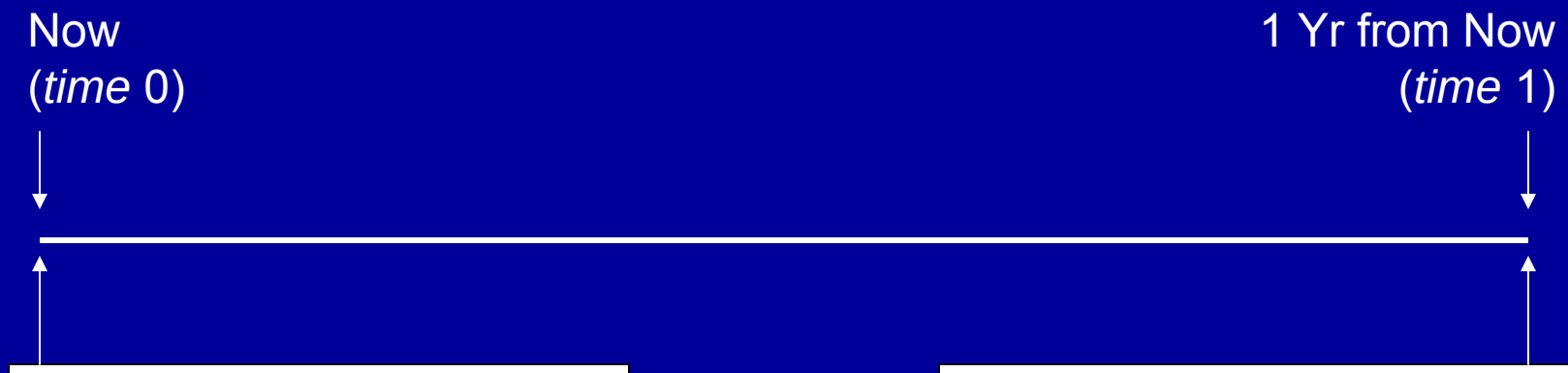


What is a forward…

Forwards

Example: 1-year Forward Contract:

Timeline:



Price agreed now,

No cash changes hands.

Suppose Index = 100.

Agreed price might be 105.

Suppose Index = 95.

Forward Buyer (long) **receives $95**, owes $105: **Net = -$10**.

Forward Seller (short) receives $105, **owes $95**: **Net = +$10**.

Example Use of Forward (long)…

- Foreign investor wants to place capital into diversified portfolio of U.S. real estate, quickly, without being taken advantage of by locals with more familiarity in U.S. mkts.
- Initially purchases forward contracts on a broad index (e.g., 1-3 yrs maturity). Locks in current pricing.
- Over time (1-3 yrs) works with specialized investment mgrs & local JV partners to replace the synthetic position with investment in a portfolio of physical properties, unwinding forward positions as actual properties are purchased.

Another Example (short)

- Investor finds a "real bargain" office property for $100M (anyway, investor can turn the bldg around better than anyone else, project will take 2 years, very profitable, *except…*)
- Investor feels the office market is headed for a downturn.
- *What are you going to do?...*

Use of the forward…

Example (continued…)

- Buy the office bldg for $100M.
- Take a 2-yr $100M short position in Office Index Forward Contract (no cash outflow).
- In 2 years suppose investor has added $10M to office bldg value (profit, above cost), but:
- Suppose office market has fallen 10%.
- Without derivative, mkt fall wipes out project profit.
- With derivative full $10M profit is retained.

Same Example (more detail…)

- Suppose office mkt rises 10%:
  - Bldg now worth $110M + $10M added val = $120M.
  - Investor owes $110M on Forward, less price (say, $106M), for net: $120 – 110 + 106 = 116
  - $16M profit (after paying $100M for bldg.)
  - $10M due to value add, $10M due to office mkt, less $4M loss on Forward short.

Example (continued…)

- Suppose office mkt falls 10%:
  - Bldg now worth $90M + $10M added val = $100M.
  - Investor owes $90M on Forward, less price ($106M), for net: $100 – 90 + 106 = 116
  - $16M profit (after paying $100M for bldg.)
  - $10M due to value add, $16M gain on Forward short, less $10M loss due to office market.

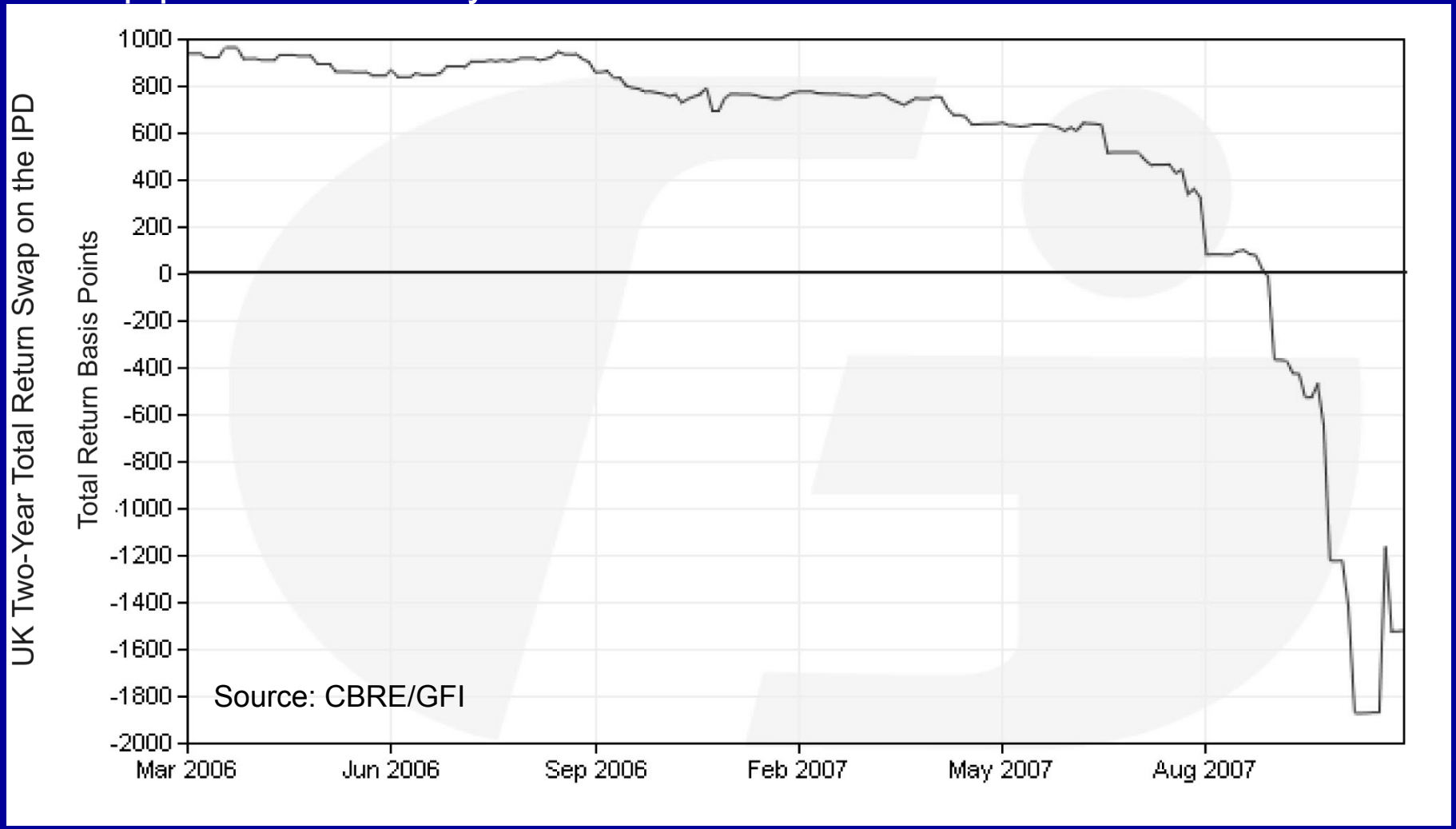
Lesson from Example:

- Investor reduced risk.
- (Derivative as a *risk mgt* tool.)
- Investor *made money* ($10M) on his/her *specialized expertise* (finding office turnaround bargains)
- ("Harvesting alpha")
- No matter what happened in the broader market.
- ("Laying off beta".)

Pricing history of the NCREIF Index Total Return Swap…

Notice how quickly the derivative price reflected the credit crunch. Meanwhile, the NPI is still going ***up***, by 3.56% (capital retn +2.25%) in 07Q3, and 3.21% (cap ret 1.86%) in 07Q4.

The US derivatives market is still very thin and illiquid. Prices don't so much reflect an actual market as derivatives brokers' guesses about what prices should be. But the UK derivatives market is much denser and more active and mature. Here is the history of IPD total return swap prices since early 2006…



For this pricing to be “rational”, investors must believe the UK commercial property market is in the process of a ***collapse*** (e.g., 30% loss in value over the next 2 yrs - equivalent to the crash of the early 1990s).