The *"8 Trillion Opportunity"* …

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The *"8 Trillion Opportunity"* …

????

U.S. Commercial Real Estate Value of Stock = $8 Trillion
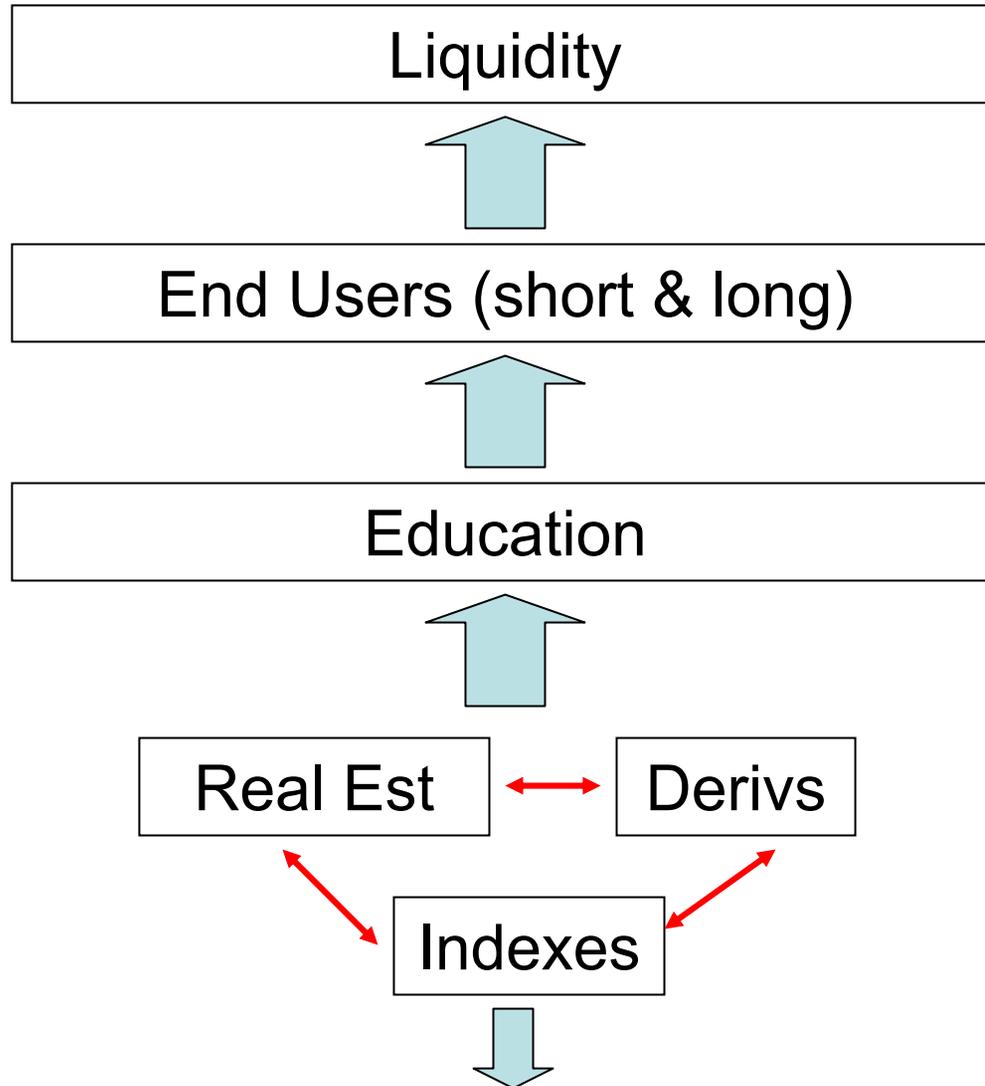
But…

NCREIF 2006 Transactions ≈ $30 Billion.

RCA 2006 Transactions ≈ $330 Billion.

Times IPD Derivs/Cash Ratio of £3B/ £8B (07Q1)

= $11 Billion on NCREIF, $124 Billion on RCA . . .

(It's not $8 Trillion, but it's plenty big, & still with room to grow!)

"The Chicken & the Egg" …

Liquidity

↑

End Users (short & long)

↑

Education

↑

Real Est ↔ Derivs

Real Est ↘   ↙ Derivs

Indexes

↓

Derivs *Pricing ???...*

Equilibrium Swap Price

Consider a total return swap…

Suppose:
- LIBOR = 5%,
- Real estate index equilibrium risk premium (over LIBOR) is 2%.

R.E. mkt equilibrium expected total return is:
$$LIBOR + RP_S = 5\% + 2\% = 7\%.$$

Index consensus expected total return is:
$$E[r_S] = LIBOR + RP_S = 5\% + 2\% = 7\%.$$

Long position will pay F as high as (no higher than):
$$F^L = LIBOR = 5\%. \quad Why?...$$

Will earn 5% on LIBOR bond of notional amt, plus expected 7% on indx return ➔ 7% + 5% - 5% = 7% expctd net retn on overall position (covered swap), which has risk equal to that of RE index.

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Index consensus expected total return is:
$$E[r_S] = \text{LIBOR} + RP_S = 5\% + 2\% = 7\%.$$

Short position will take *F* as low as (no lower than):
$$F^S = \text{LIBOR} = 5\%. \quad \textit{Why?...}$$

Will earn expected 7% on covering real estate of same risk as index while paying expected 7% on swap plus recv *F*:
➜ 7% - 7% + 5% = 5% LIBOR on net overall position which has LIBOR risk (RE prop & Indx risk cancels).

Equilibrium Swap Price

Now suppose:
*   LIBOR = 5%,
*   Real estate index equilibrium risk premium (over LIBOR) is 2%.
*   Index lags mkt, giving index +4%/yr "overhang" during contract period (RE mkt has been rising strongly)…

R.E. mkt equilibrium expected total return is:

$$\text{LIBOR} + RP_S = 5\% + 2\% = 7\%.$$

Index consensus expected total return is:

$$E[r_S] = \text{LIBOR} + RP_S + lag = 5\% + 2\% + 4\% = 11\%.$$

Long position will pay F as high as (no higher than):

$$F^L = \text{LIBOR} + lag = 5\% + 4\% = 9\%. \quad Why?...$$

Will earn 5% on LIBOR bond of notional amt, plus expected 11% on indx return ➤ 11% + 5% - 9% = 7% expctd net retn on overall position (covered swap), which has risk equal to that of RE index.

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Short position will take F as low as (no lower than):

$$F^S = \text{LIBOR} + lag = 5\% + 4\% = 9\%. \quad Why?...$$

Will earn expected 7% on covering real estate of same risk as index while paying expected 11% on swap & recv F:
➔ 7% - 11% + 9% = 5% LIBOR on net overall position which has LIBOR risk (RE prop & Indx risk cancels).

Equilibrium Swap Price

Now suppose same as before only:

- Long believes RE mkt will perform 1.5%/yr better than LR equilibrium over period of contract ("bullish").
- Short believes RE mkt will underperform LR equilibr by 3%/yr ("bearish").
- Short believes they will beat LR equilibr in their *own* properties by **α** = 1%/yr (4%/yr over bearish expctns)…

Long position will pay *F* as high as (no higher than):

$$F^L = \text{LIBOR} + lag + bull = 5\% + 4\% + 1.5\% = \textbf{10.5\%}.$$
Why?...

Will earn 5% on LIBOR bond of notional amt, plus expected 7%+4%+1.5% = 12.5% on indx return

➔ 12.5% + 5% - 10.5% = 7% expctd net retn on overall position (covered swap), which has risk equal to that of RE index.

Equilibrium Swap Price

Now suppose same as before only:

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- Short believes RE mkt will underperform LR equilibr by 3%/yr ("bearish").
- Short believes they will beat LR equilibr in their _own_ properties by α = 1%/yr (4%/yr over bearish expctns)…

Short position will take F as low as (no lower than):

F^S = LIBOR + _lag − bear − α_ = 5% + 4% - 3% - 1% = **5%**. _Why?..._

Will earn expected 7%+1%=8% on covering real estate of same risk as index while paying expected 7%+4%-3%=8% indx retn on swap plus receive F :

➔ 8% - 8% + 5% = 5% LIBOR on net overall position which has LIBOR risk (RE prop & Indx risk cancels).

Potential range in bid-ask spread is 550 bps:
Long will pay up to 10.5%, Short will accept as low as 5%.

Other Pricing Considerations:

- Private values:
  - Party/counter-party complementary beliefs (e.g., bullish & bearish expectations on long & short sides, as in previous example).
  - "Insurance"/hedge value (short position).
  - Transactions/mgt cost savings (long side).
  - Diversification (long side).
- Liquidity values/Preferred habitat:
  - Suppose long parties tend to want longer term contracts than short parties: ➔ term price curve.

Any 2 parties can agree to whatever they want (especially in OTC trading)!

Equilibrium Swap Price

Notes:

•The pricing results here will be identical for a capital return swap instead of a total return swap, except that we deduct the expected magnitude of the income return component from the price *(F, on both sides)*, because the long position is still exposed to all of the real estate index risk for which the equilibrium total return is necessary to compensate for bearing that risk, yet receives only the capital component of the total return in the swap, and the short position obtains the total real estate return on their cover while eliminating virtually all real estate systematic *("beta")* risk exposure.

•If the index were tradable ("complete markets"), then the *"lag"* described here could not exist, and arbitrage would drive the equilibrium price to exactly LIBOR as in the first example.

•Note that the *"lag"* term here reflects not only lag (momentum) in the index (which will vary from positive to negative over the cycle), but also any other reasons why $E[r_S]$ differs from equilibrium $i+RP_S$ expectations, including: seasonality in index; index risk different from risk of underlying properties in the index (e.g., lagging & smoothing can cause index risk to be less than property risk); etc.

•Here α ("alpha") is defined relative to <u>equilibrium</u> (long-run) expectations for the short party's own real estate. If α is defined relative to the short party's current "bearish" expectations about the market, then the *"bear"* term drops out of the price condition (but the *"bear"* term is in that case included in α, so the numerical result is the same as here).

• For more depth and detail, see: D.Geltner & N.Miller *et al, "Commercial Real Estate Analysis & Investments"* , Thomson/South-Western College Publishing Co. Cincinnati (2007) (ISBN# 0-324-30548-6).