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The University of Chicago Booth School of Business

Some Thoughts on Greatest Hits (and Misses)!

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Some Thoughts on Winners & Losers: Agenda

- Winning Arguments:
  - The components of return
  - JVs as principal/agent problems
  - The drag of transaction costs
  - Core *v.* non-core performance

- **Losing Arguments (at least for now):**
  - **Cap rates *v.* interest rates**
  - **Impact of leverage → the law of one price**
  - **The volatility of land values → discount to replacement cost**
  - **Mezz debt & levered loans**
  - **State & local finances ← a mispriced risk**

- **My Next Argument:**
  - **Urban multifamily: NIMBY *v.* YIMBY**

Some Points of Clarification

- By "winning argument,"
  - I mean that:
    - the CRE market is now generally in agreement with my assertion(s)
  - I don't mean that:
    - I was the first to make this assertion, or
    - that I strongly influenced the market's acceptance of this assertion.
    - [*It could be that I simply well timed the market's changing view.*]
- By "losing argument,"
  - I do not mean that:
    - I am wrong in my assertion(s)
  - I do mean that:
    - market's acceptance of this assertion has yet to take place.

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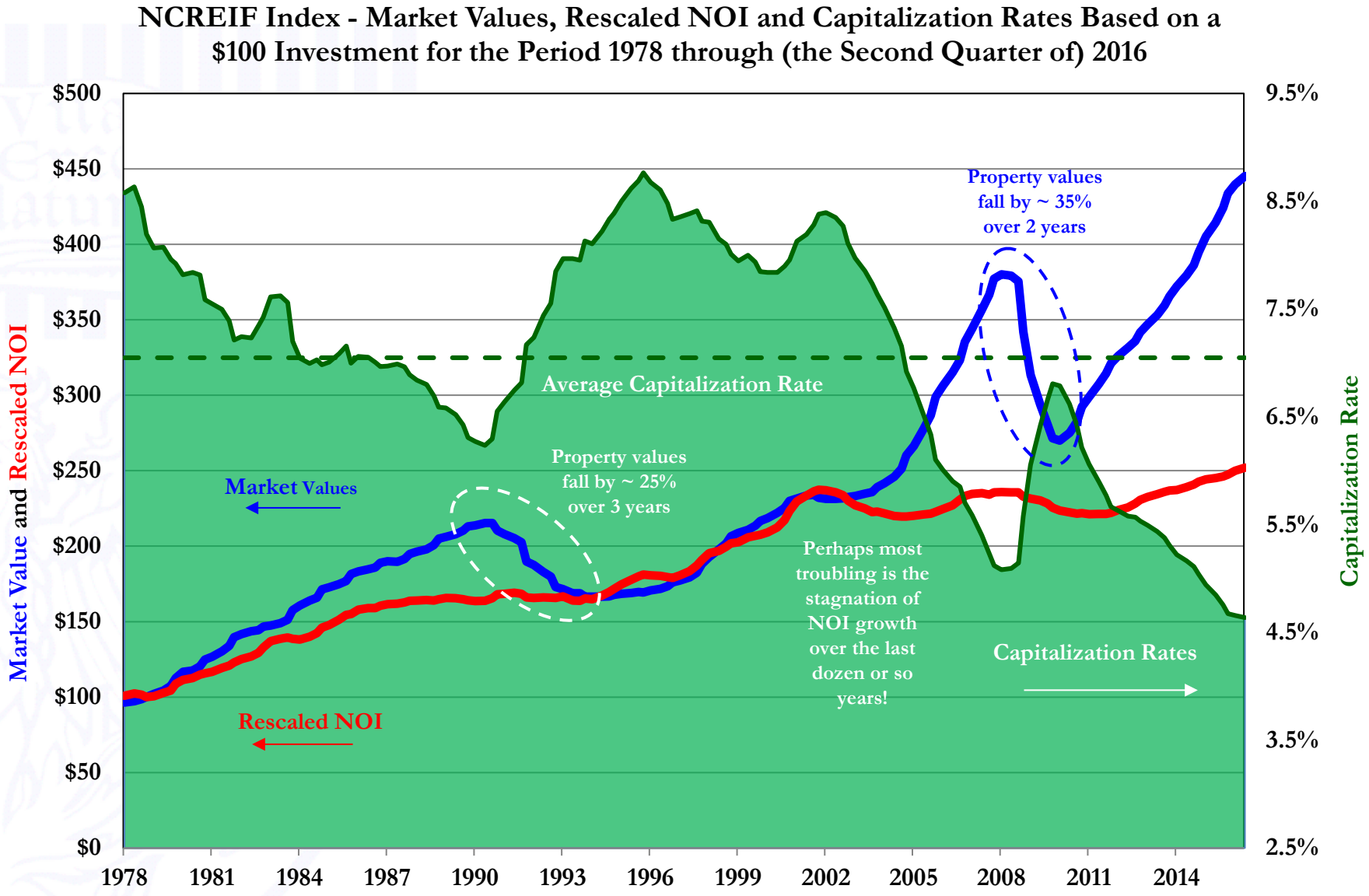
The Components of Return



Components of Return: Fundamental Relationships

- In the long run, asset-level returns (k_a) are primarily a function of the initial cash flow yield $\left(\frac{CF_1}{P_o}\right)$ and the growth rate (g):

$$k_a = \frac{CF_1}{P_0} + g$$

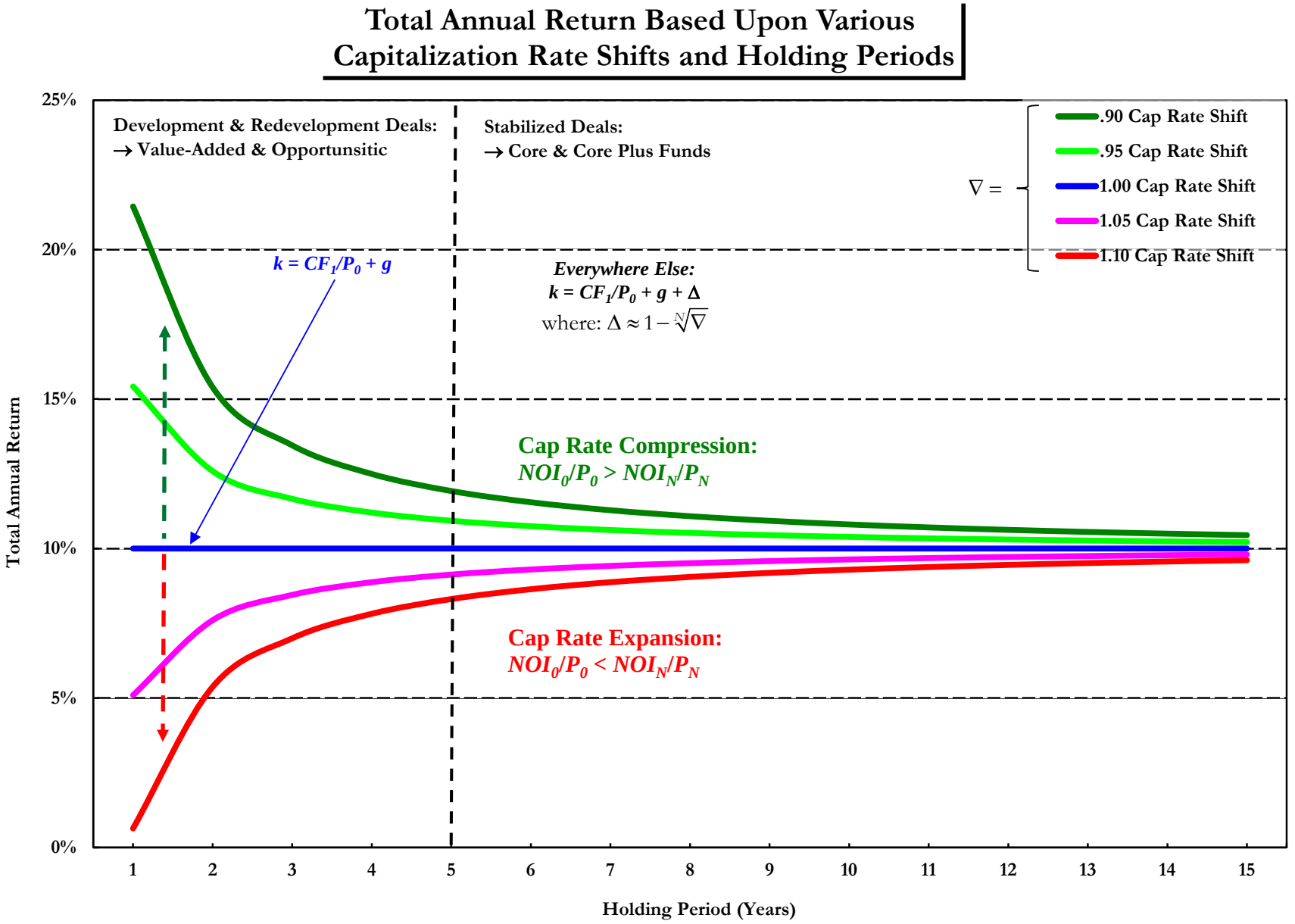
- In the short run, asset-level returns can be heavily influenced by the effects of shifting capitalization rates (∇):

$$k_a = \frac{CF_1}{P_0} + g + \nabla$$

  - ∇ : More easily seen in the following graph.

- Note: cap rate = $NOI_1/P_0 \neq CF_1/P_0$

Components of Return: Holding Period & Cap Rates



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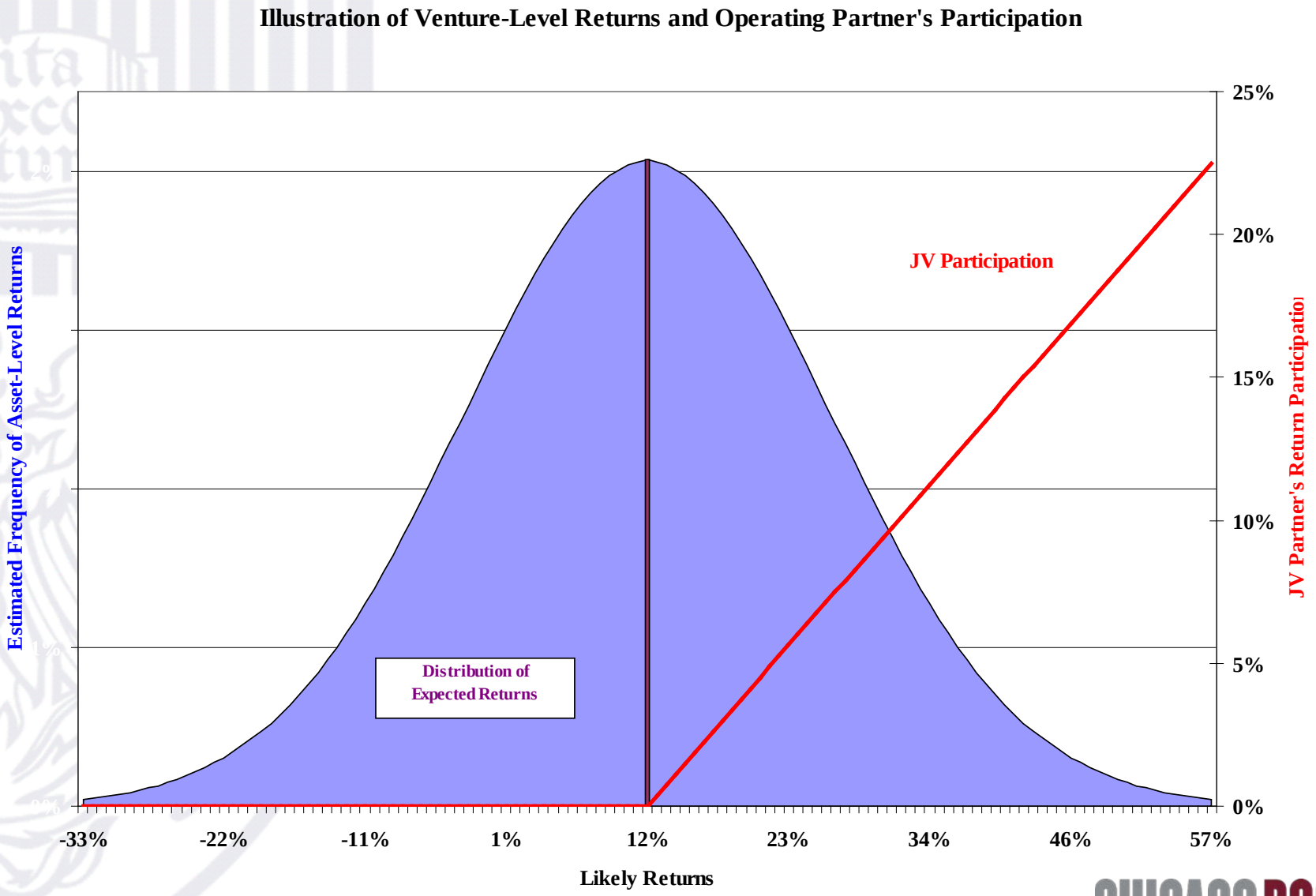
Joint Ventures: Numerical Example

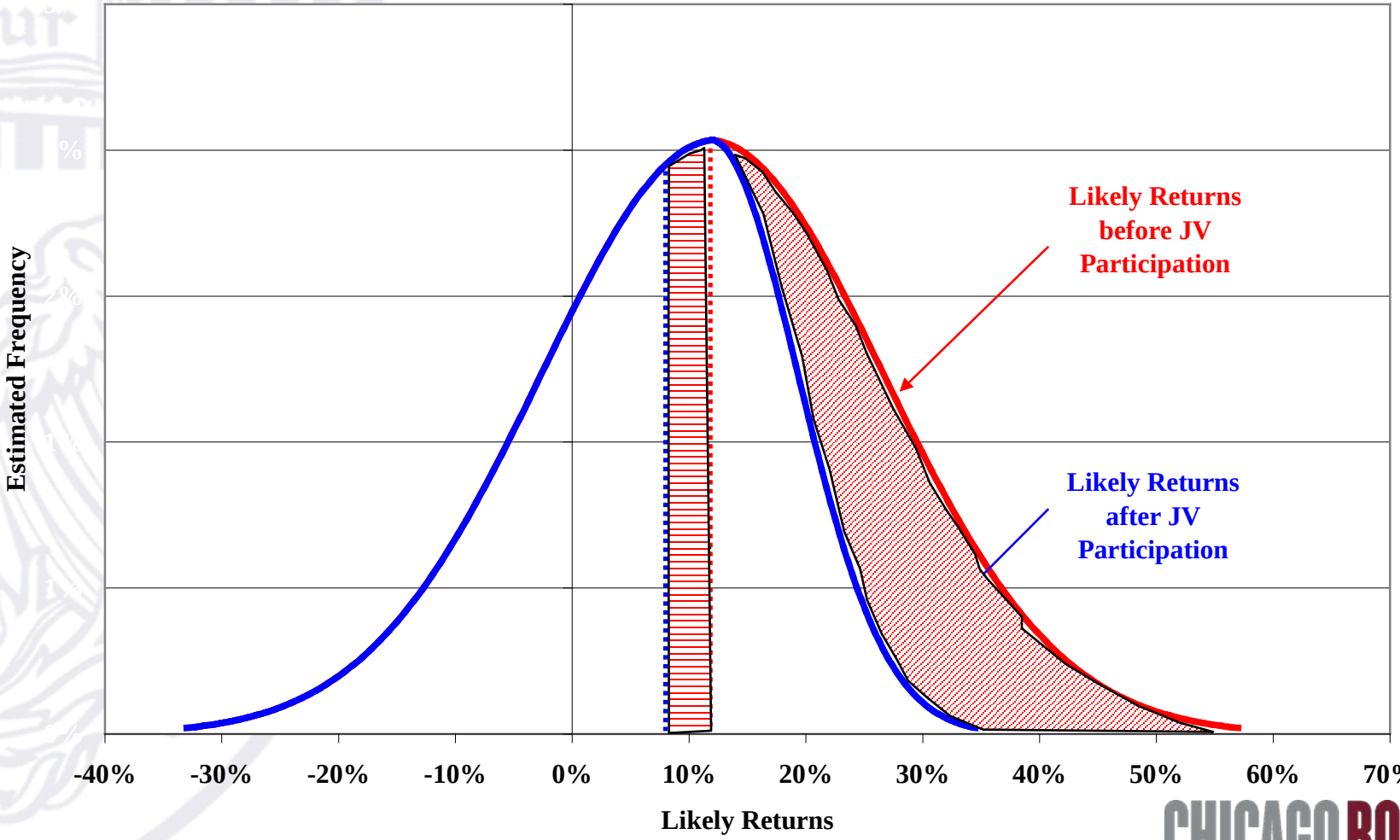
- Property-Level Return Distribution:
  - Average Return: 12.5%
  - Volatility 15.0%
- Joint Venture Structure:
  - Ongoing fees 0.5%
  - Investor's Preference 12.0%
  - Residual Split:
    - Investor 50%
    - Operating Partner 50%
- Notes:
  - Monitoring/supervision costs always reduce returns.
  - Investor's preference typically set at or near deal's likely return.
  - The operating partner's "promoted" interest creates an option-like return for operator.
  - The value of the option reduces the investor's upside.

Joint Ventures: Property Returns & Operator's Promote



Joint Ventures:
Returns Before and After JV Participation

Illustration of Venture-Level Returns
before and after the Venture Partner's Participation



Joint Ventures: Numerical Example (*continued*)

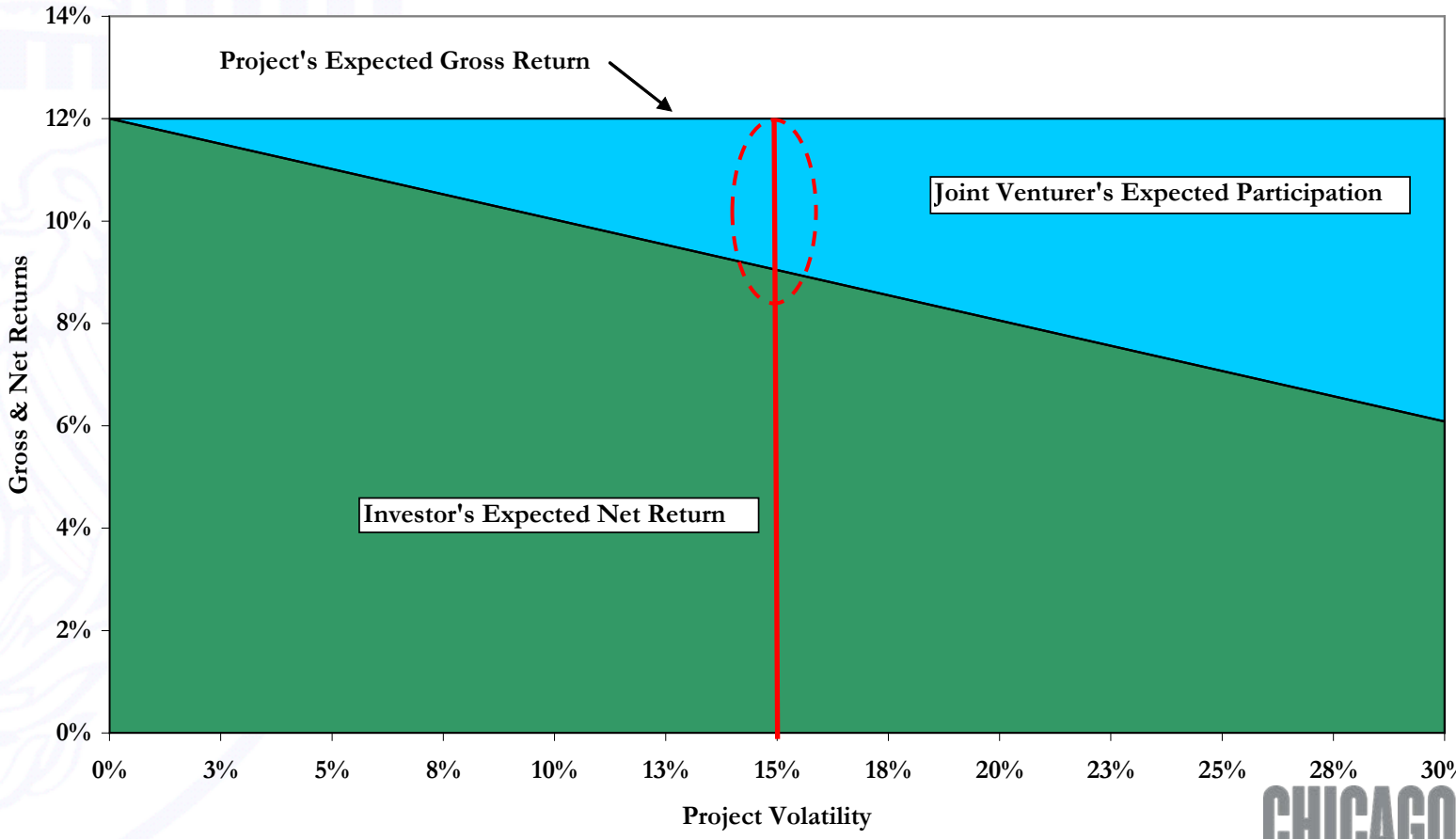
- **Joint Venture Deal after Operating Partner:**
  - **Likely Returns:**
    - **JV Deal before Operating Partner** **12.5%**
    - **Ongoing (Monitoring) Fees** **0.5%**
    - **Operating Partner's Participation** **3.0%**
    - **Investor's Net Return** **9.0%**
  - **Volatility (Standard Deviation):**
    - **JV Deal before Operating Partner** **15.0%**
    - **Operating Partner's Participation** **3.5%**
    - **Investor's Net Return** **11.5%**

- **Notes:**
  - **The operating partner's "promoted" interest reduces the investor's net return by 300 bps:**
    - **Even though the value of the promote equals zero at the most likely return,**
    - **This is attributable to operating partner's asymmetric participation in returns.**
  - **The reduction in the investor's standard deviation is a statistical illusion:**
    - **The investor still receives 100% of the economic downside.**

Value of Operator's Promote Increases with Volatility

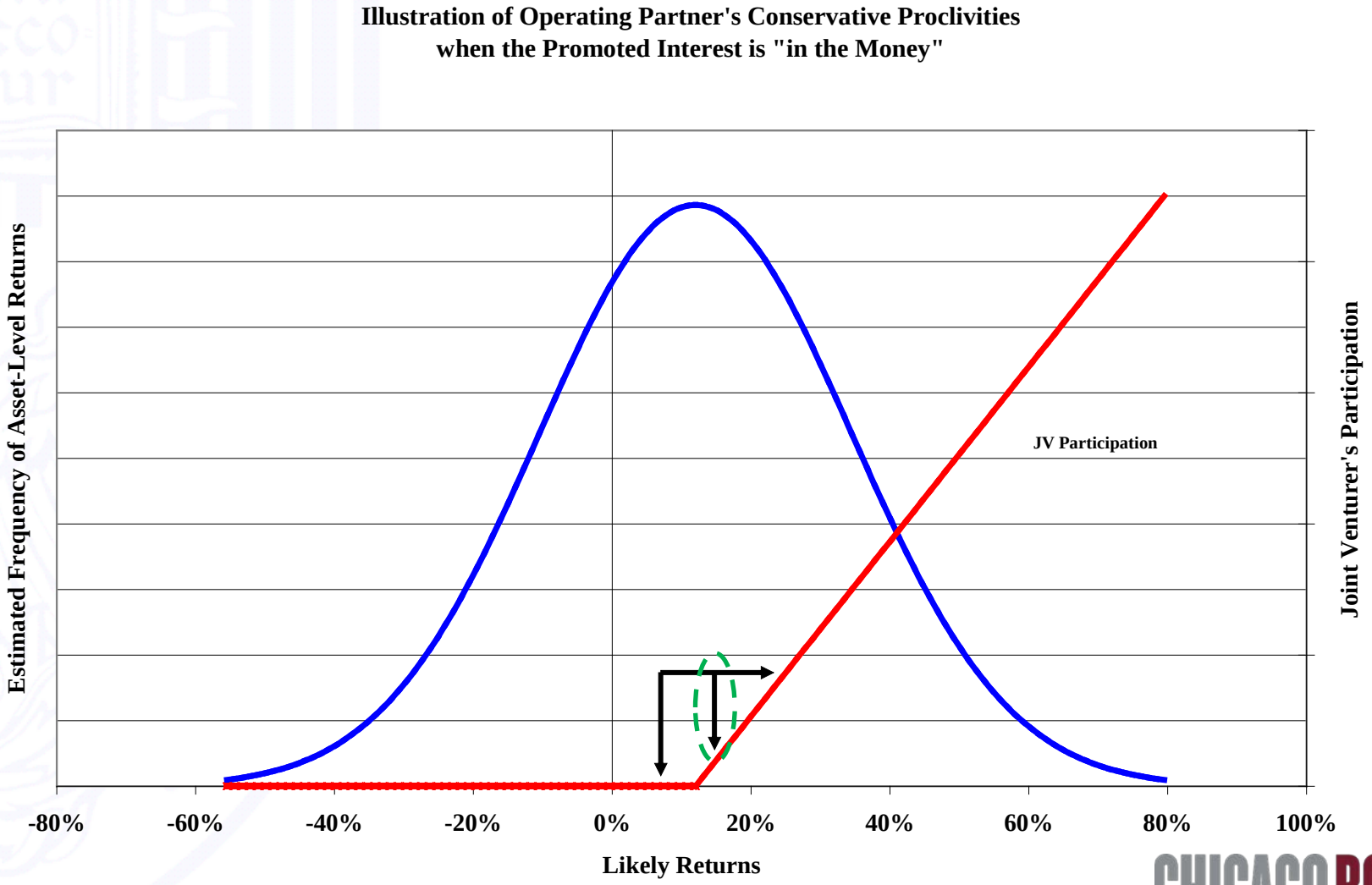
- Investor's net return declines with greater venture-level volatility.
- Of course, investor can alter "pref" &/or promote, given *E*(volatility).

Illustration of Joint Venturer's Increasing Expected Participation
as Project Volatility Increases



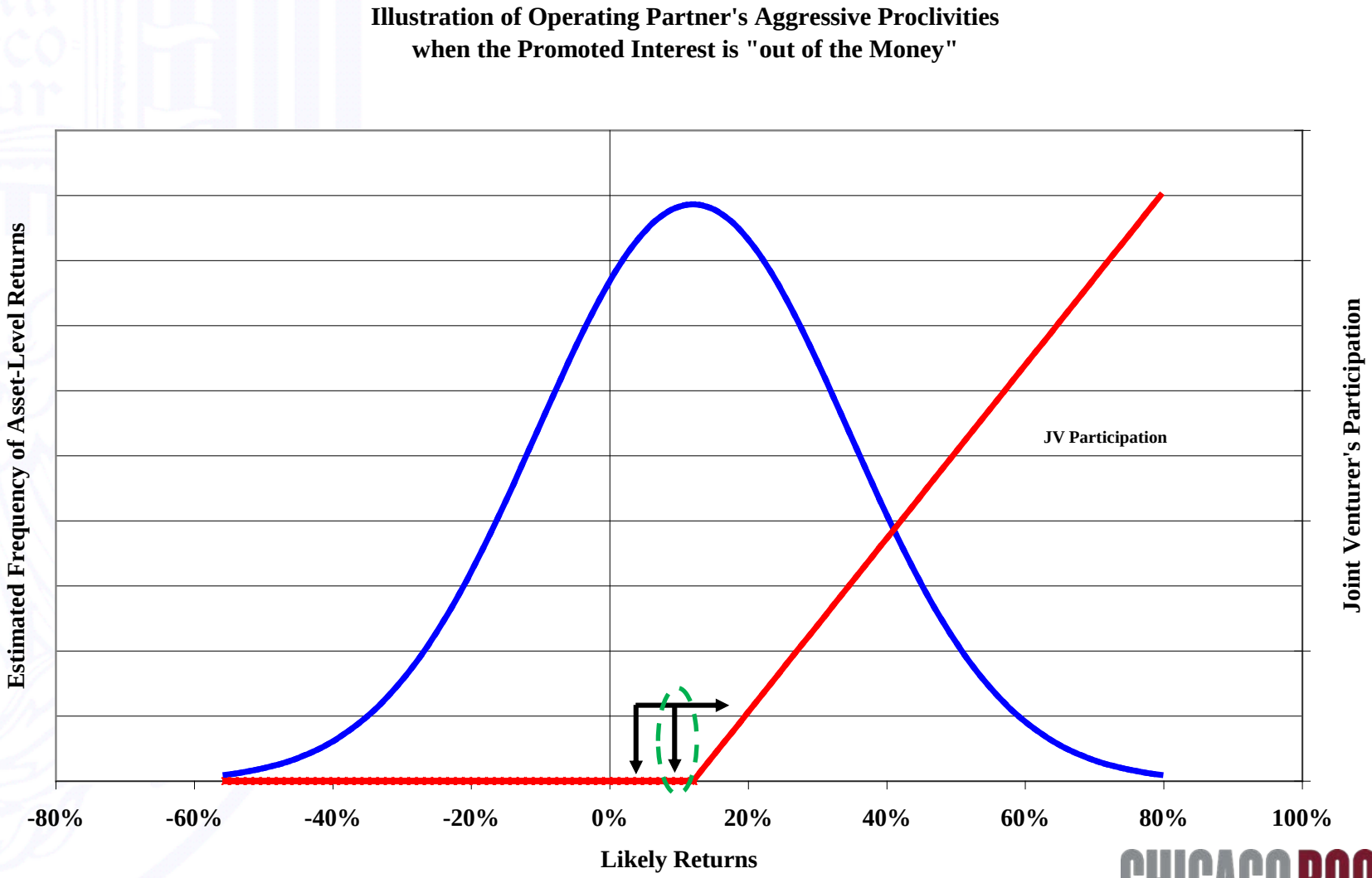
Motivational Issues – "In-the-Money" Promote

- If the operating partner has earned (but not realized) its promoted interest, they tend to make "safe" bets in the future (*i.e.*, they become risk-averse).



Motivational Issues – "Out-of-the-Money" Promote

- If the operating partner has not earned its promoted interest, they tend to make risky bets (*i.e.*, they become risk-seeking).



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- **My Next Argument:**
  - Urban multifamily: NIMBY *v.* YIMBY

Transaction Costs: A "Drag" on Returns

- The "round-trip" costs to acquiring and disposing of real estate are quite high.

- The drag on returns can be approximated as:

$$\text{Redution in Total Return} = \frac{\dfrac{\text{Total Transaction Costs}}{\#\,\text{Years in Holding Period}}}{1 - LTV}$$

- These transaction costs clearly reduce (gross) returns; the "drag" increases as:
  - the holding period shortens, and
  - the loan-to-value ratio increases.

- This matters because the holding periods and leverage ratios tend to differ by core *v.* non-core real estate strategies:
  - Core properties tend to have long lives and low LTVs.
  - Non-core properties tend to have short lives and high LTVs.

Transaction Costs: A "Drag" on Returns – Simple Examples

- Let's assume that the round-trip costs are 3.5% of the asset's price (*e.g.*, 1.5% on the way in and 2.0% on the way out).

- Let's contrast:
  - a 5-year *v.* a 10-year hold, and
  - 0% LTV *v.* 50% LTV.

Approximate Reduction in Total Return Due to Transaction Costs as a Function of Leverage and Holding Period

	Holding Period									
LTV Ratio	1	2	3	4	5	6	7	8	9	10
0%	3.50%	1.75%	1.17%	0.88%	0.70%	0.58%	0.50%	0.44%	0.39%	0.35%
10%	3.89%	1.94%	1.30%	0.97%	0.78%	0.65%	0.56%	0.49%	0.43%	0.39%
20%	4.38%	2.19%	1.46%	1.09%	0.88%	0.73%	0.63%	0.55%	0.49%	0.44%
30%	5.00%	2.50%	1.67%	1.25%	1.00%	0.83%	0.71%	0.63%	0.56%	0.50%
40%	5.83%	2.92%	1.94%	1.46%	1.17%	0.97%	0.83%	0.73%	0.65%	0.58%
50%	7.00%	3.50%	2.33%	1.75%	1.40%	1.17%	1.00%	0.88%	0.78%	0.70%
60%	8.75%	4.38%	2.92%	2.19%	1.75%	1.46%	1.25%	1.09%	0.97%	0.88%
70%	11.67%	5.83%	3.89%	2.92%	2.33%	1.94%	1.67%	1.46%	1.30%	1.17%
80%	17.50%	8.75%	5.83%	4.38%	3.50%	2.92%	2.50%	2.19%	1.94%	1.75%

Transaction Costs:
A "Drag" on Returns – Core *v.* Non-Core

Approximate Reduction in Total Return Due to Transaction Costs as a Function of Leverage and Holding Period

	Holding Period									
LTV Ratio	1	2	3	4	5	6	7	8	9	10
0%	3.50%	1.75%	1.17%	0.88%	0.70%	0.58%	0.50%	0.44%	0.39%	0.35%
10%	3.89%	1.94%	1.30%	0.97%	0.78%	0.65%	0.56%	0.49%	0.43%	0.39%
20%	4.38%	2.19%	1.46%	1.09%	0.88%	0.73%	0.63%	0.55%	0.49%	0.44%
30%	5.00%	2.50%	1.67%	1.25%	1.00%	0.83%	0.71%	0.63%	0.56%	0.50%
40%	5.83%	2.92%	1.94%	1.46%	1.17%	0.97%	0.83%	0.73%	0.65%	0.58%
50%	7.00%	3.50%	2.33%	1.75%	1.40%	1.17%	1.00%	0.88%	0.78%	0.70%
60%	8.75%	4.38%	2.92%	2.19%	1.75%	1.46%	1.25%	1.09%	0.97%	0.88%
70%	11.67%	5.83%	3.89%	2.92%	2.33%	1.94%	1.67%	1.46%	1.30%	1.17%
80%	17.50%	8.75%	5.83%	4.38%	3.50%	2.92%	2.50%	2.19%	1.94%	1.75%

Value-added & Opportunistic Deals

Estimated All-In Transaction Costs = 3.50%

$$\text{Reduction in Total Return} \approx \frac{\text{Total Transaction Costs}}{\frac{\#\text{Years in Holding Period}}{1-\text{LTV}}}$$

Core (with Moderate Leverage) Deals

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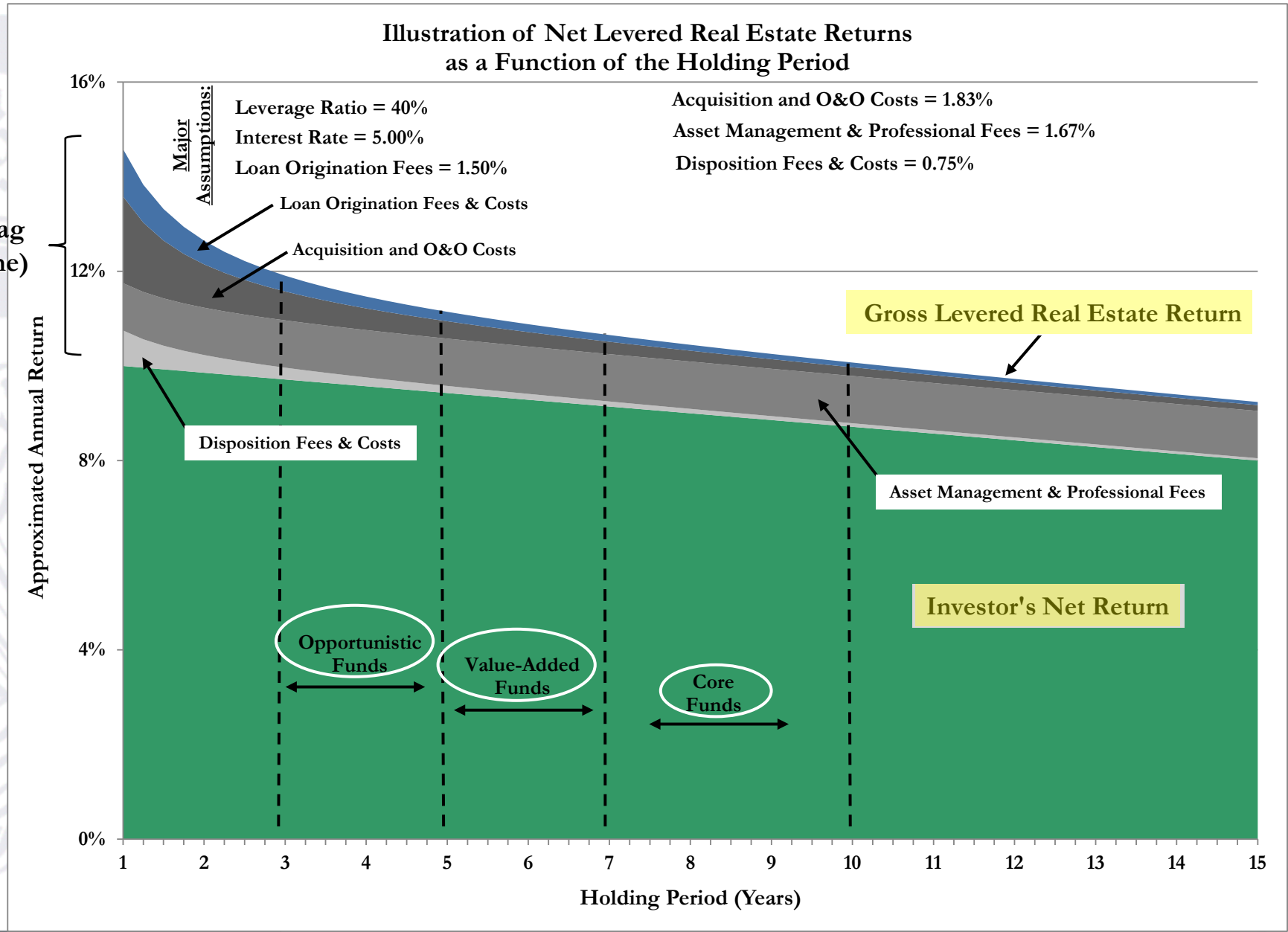
An Example of the Return Drag of Fees & Costs



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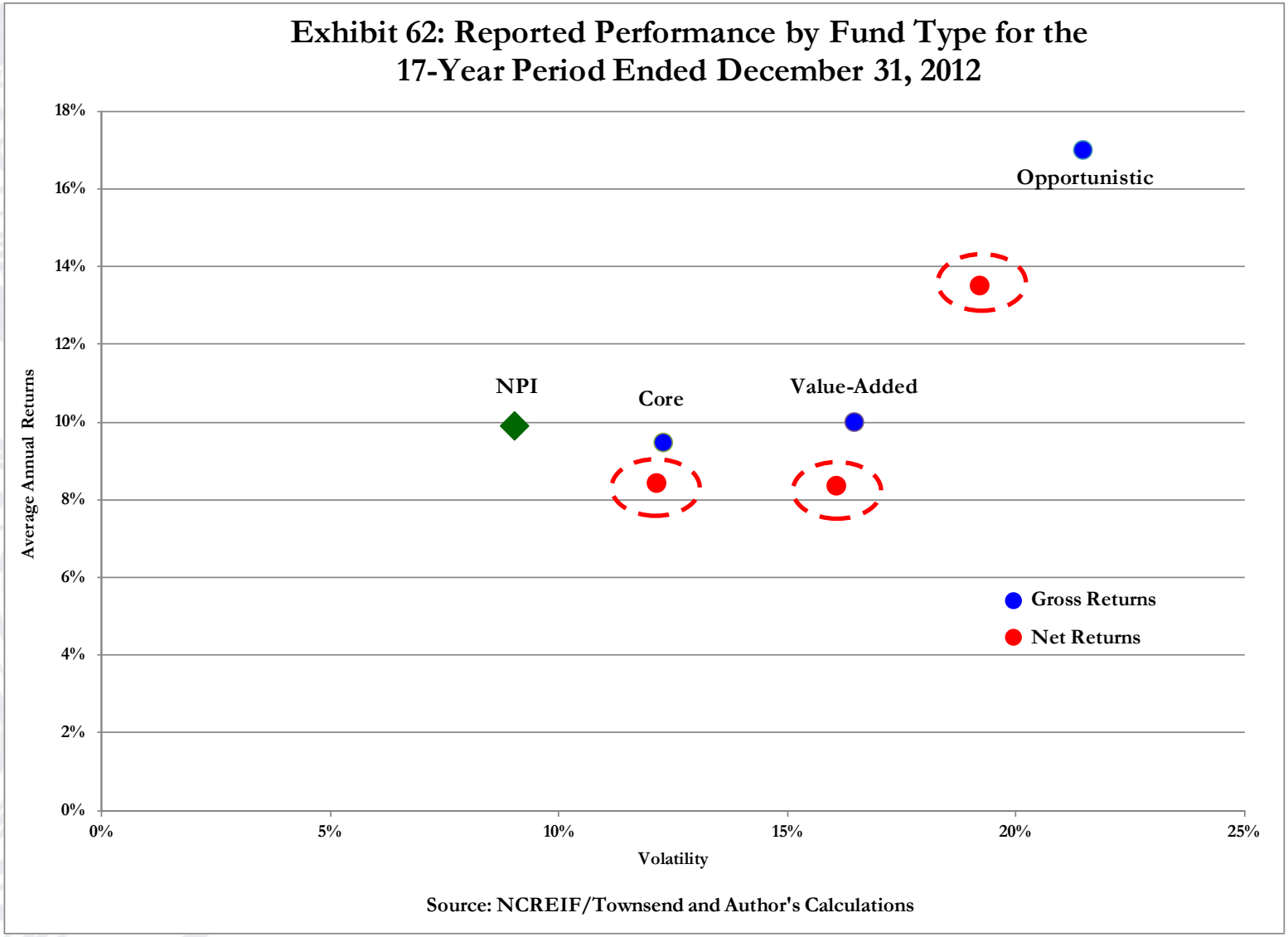
Gross & Net Returns by Strategy



Let's Consider Fees by Strategy

Exhibit 63: Reported Performance by Fund Type for the 17-Year Period Ended December 31, 2012

	Gross (Value-Weighted) Returns				Net (Value-Weighted) Returns		
	Core		Non-Core		Core	Non-Core	
Year	NPI	NFI-ODCE	Value-Added	Opportunistic	NFI-ODCE	Value-Added	Opportunistic
Arithmetic Average							
1996-2006	12.56%	12.90%	15.00%	24.19%	11.81%	13.40%	20.27%
1996-2012	9.92%	9.49%	10.02%	17.02%	8.45%	8.38%	13.53%
%Δ	(21.05%)	(26.41%)	(33.21%)	(29.64%)	(28.45%)	(37.46%)	(33.23%)
Standard Deviation							
1996-2006	4.16%	4.74%	6.72%	16.20%	4.67%	6.18%	13.68%
1996-2012	9.01%	12.27%	16.45%	21.45%	12.12%	16.05%	19.19%
%Δ	116.86%	158.84%	144.75%	32.42%	159.51%	159.56%	40.30%

Strategy	**GP Fees**
Core	~105 bps
Value-Added	~165 bps
Opportunistic	~350 bps

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Volatility of Opp Fund Returns Looks Understated

Exhibit 63: Reported Performance by Fund Type for the 17-Year Period Ended December 31, 2012

	Gross (Value-Weighted) Returns				Net (Value-Weighted) Returns		
	Core		Non-Core		Core	Non-Core	
Year	NPI	NFI-ODCE	Value-Added	Opportunistic	NFI-ODCE	Value-Added	Opportunistic
Arithmetic Average							
1996-2006	12.56%	12.90%	15.00%	24.19%	11.81%	13.40%	20.27%
1996-2012	9.92%	9.49%	10.02%	17.02%	8.45%	8.38%	13.53%
%Δ	**(21.05%)**	**(26.41%)**	**(33.21%)**	**(29.64%)**	**(28.45%)**	**(37.46%)**	**(33.23%)**
Standard Deviation							
1996-2006	4.16%	4.74%	6.72%	16.20%	4.67%	6.18%	13.68%
1996-2012	9.01%	12.27%	16.45%	21.45%	12.12%	16.05%	19.19%
%Δ	**116.86%**	**158.84%**	**144.75%**	**32.42%**	**159.51%**	**159.56%**	**40.30%**

- **Pre-Financial Crisis**
- **Entire Time Period**

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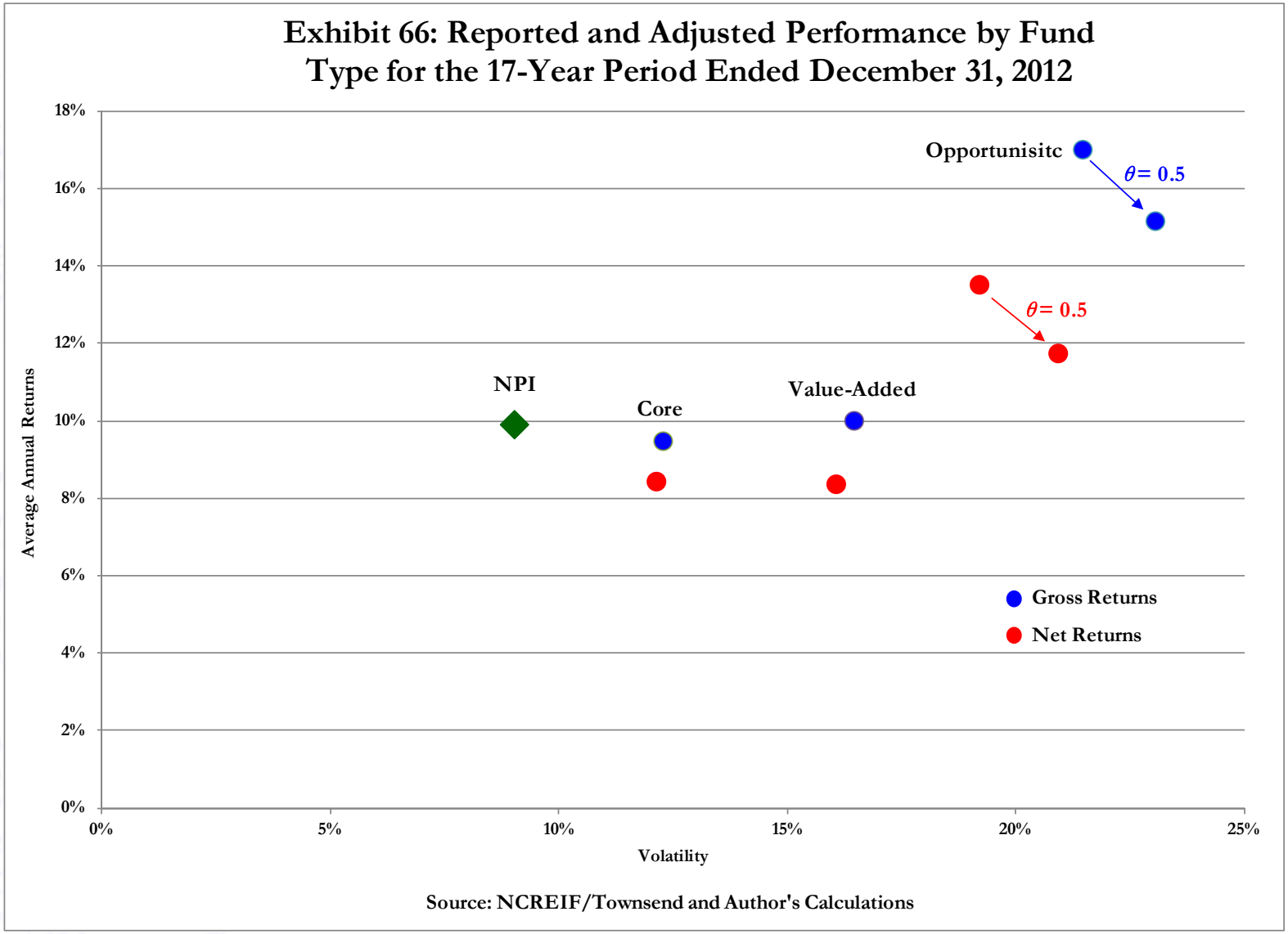
Problems with the Data for Non-Core Returns

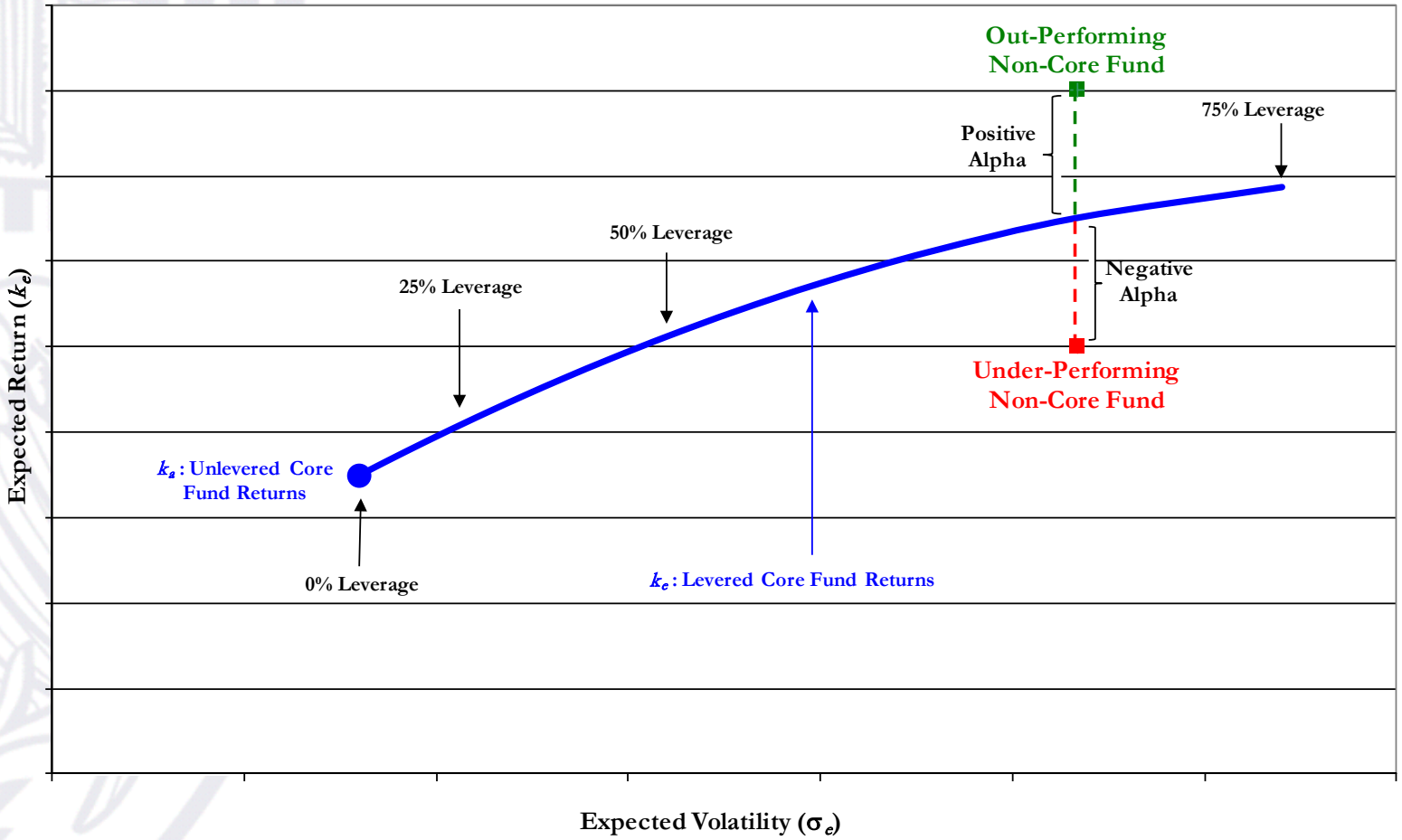
- **Voluntary, Self-Reported Results**
- **Inconsistent Methodologies for Reporting**
- **Mark-to-Market Staleness**
- **Incomplete Capture of Fund Universe**
- **Incomplete Characterization of Funds:**
  - domestic *v.* foreign,
  - debt *v.* equity, *etc.*
- **Survivorship Bias ← *only element we can attempt to correct***
  - Survivorship Bias = During & after the financial crisis, some funds stop reporting (without apparent termination)
  - Survivorship Bias Adjustment (θ) = Percentage of assets lost by non-reporting firms

Survivorship-Bias Adjusted Opp Returns in Context

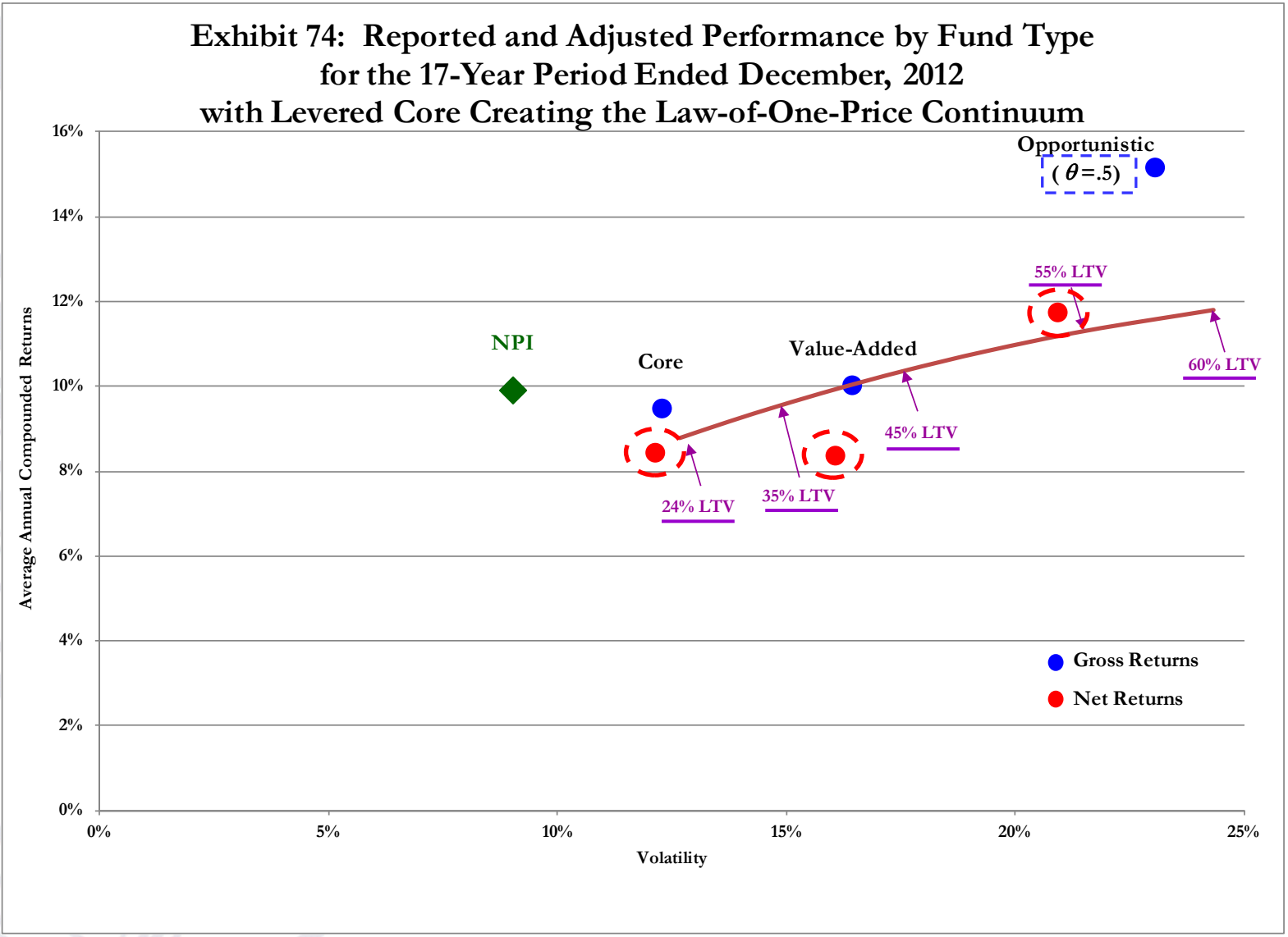


Law of One Price → Risk-Adjusted Returns: "Alpha" (α)

Exhibit 69: Application of "Law of One Price"
Levered Core Assets *v.* Non-Core Funds



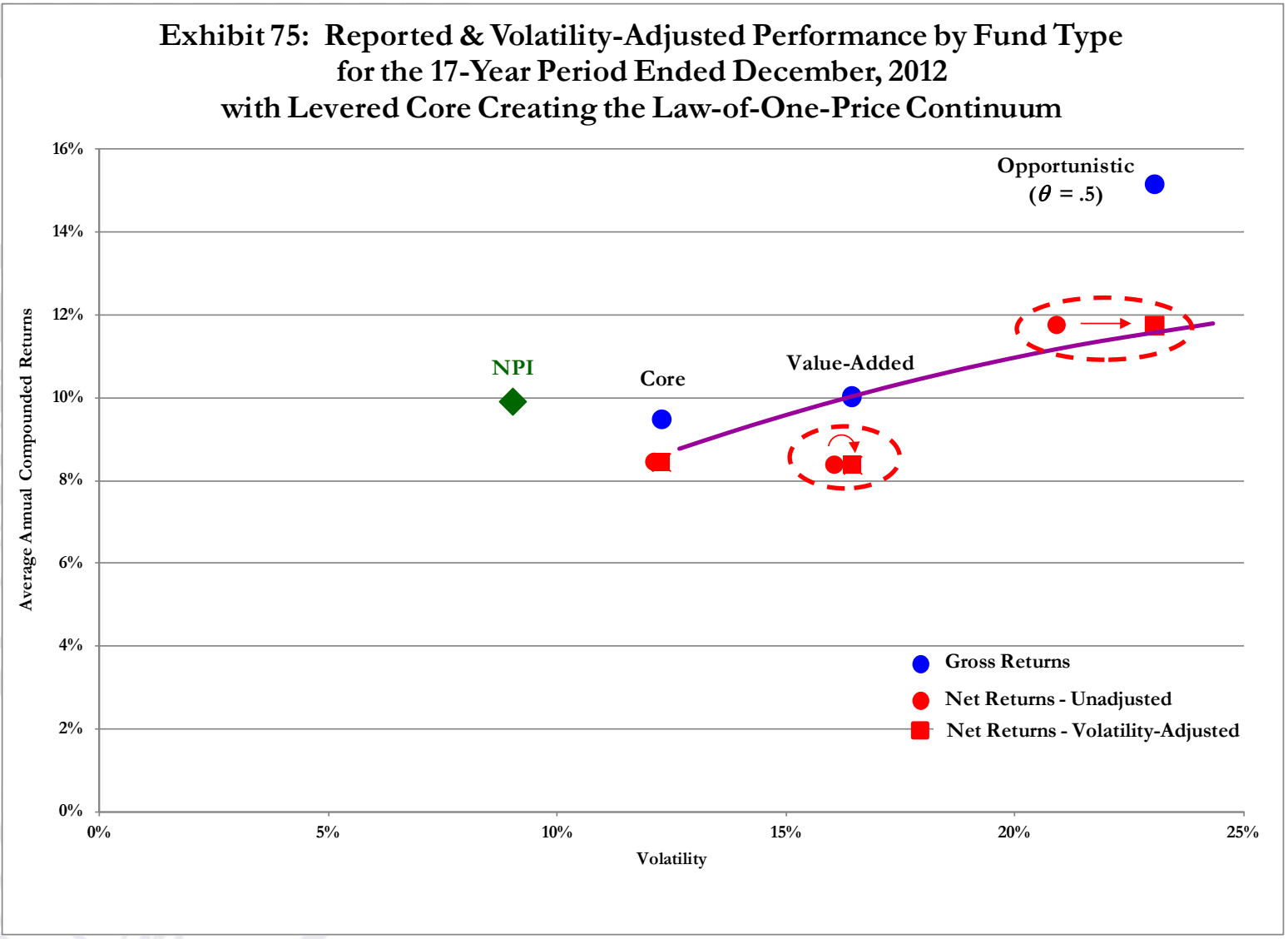
Let's Put the Tools to Work: The Results



Tools:

1. Net Returns,
2. Survivorship Bias (θ), and
3. Law of One Price:
   a) De-lever Core, assume $N = 7$
   b) Re-lever Core, assume $N = 3$

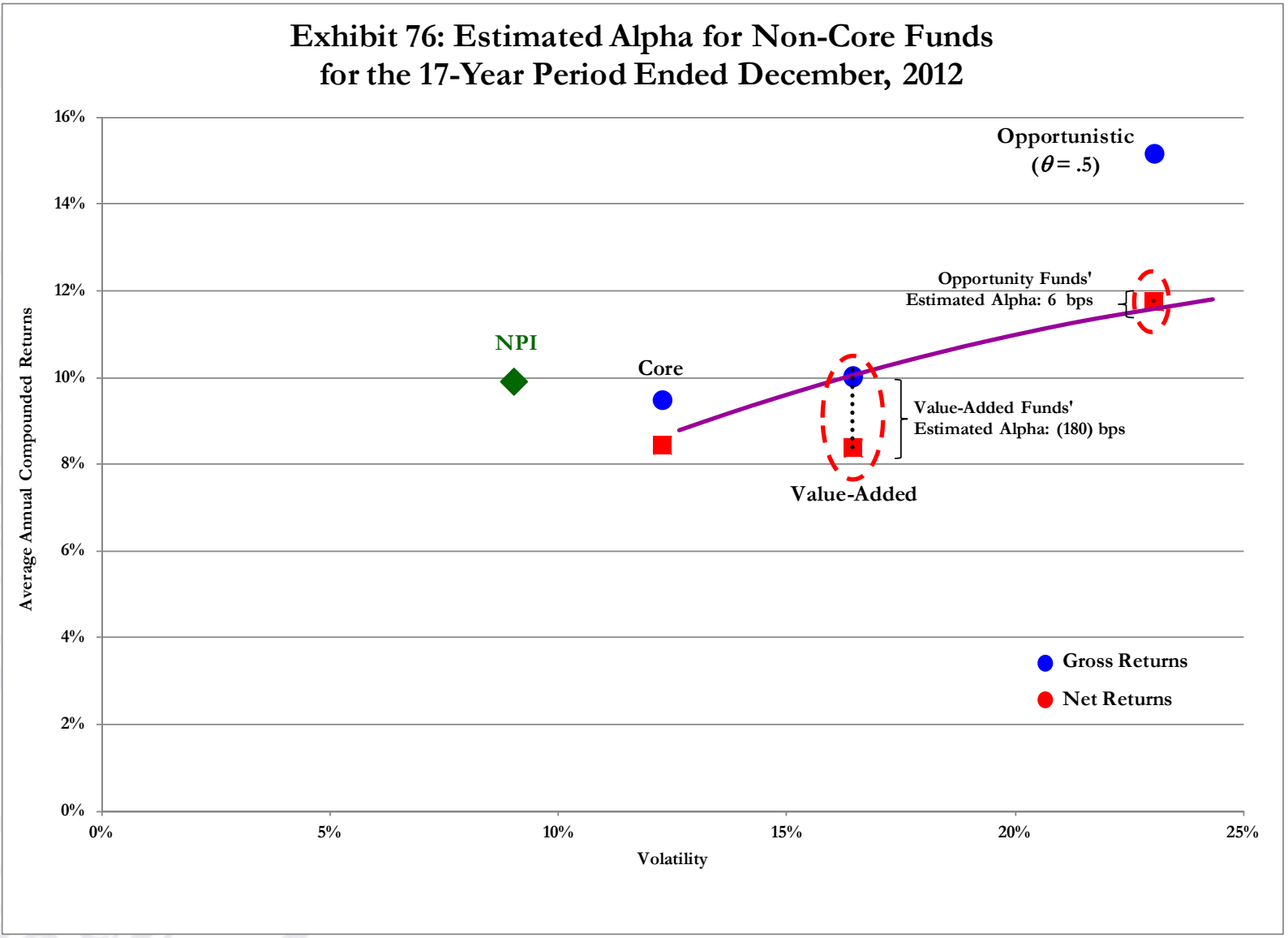
Let's Put the Tools to Work: The Results (continued)



Tools:

4. Volatility Adjustment (correct for statistical illusion)

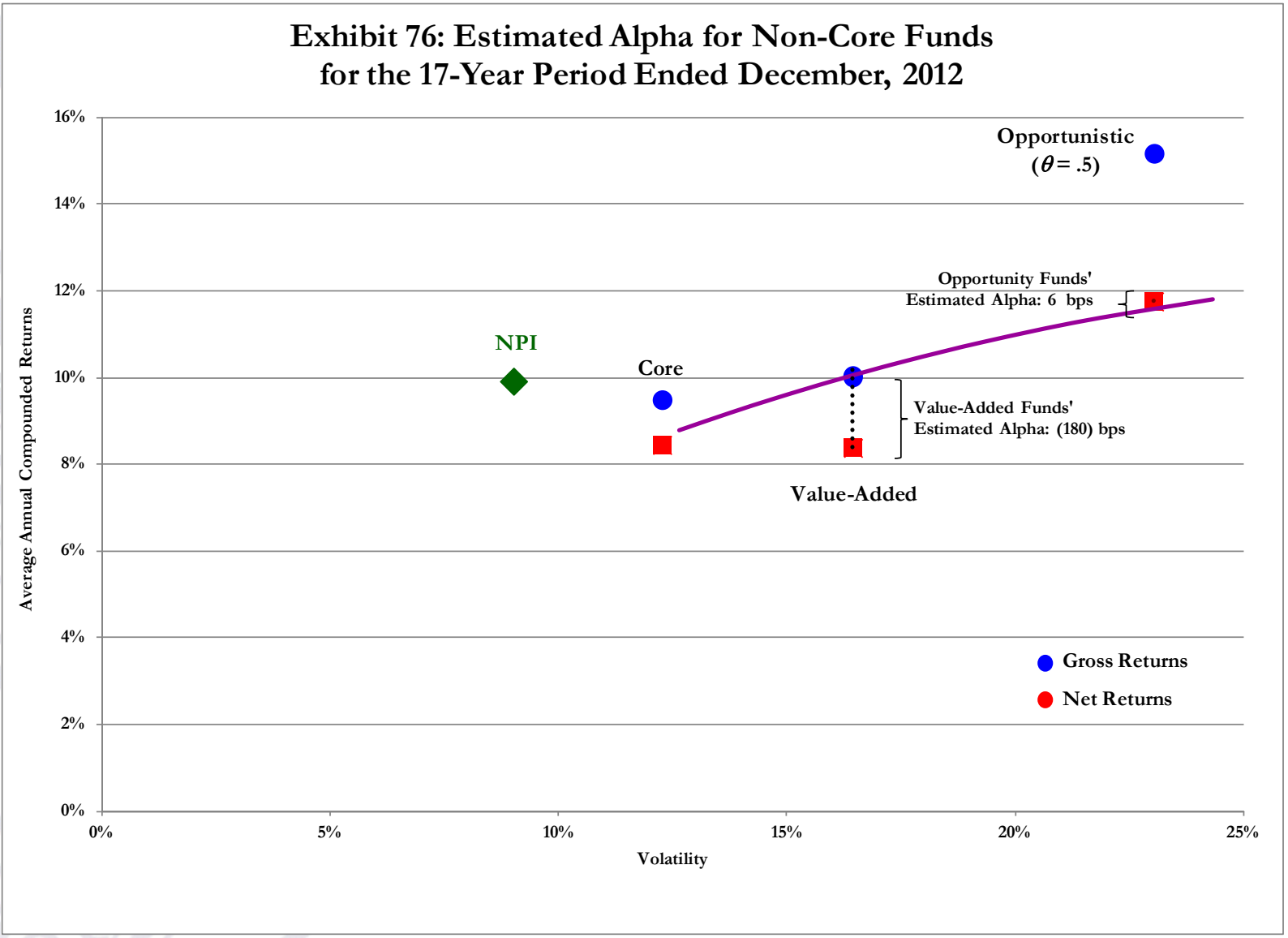
Let's Put the Tools to Work: The Results (continued)



Tools:

5. **Risk-Adjusted Returns (α)**

Let's Put the Tools to Work: The Results (continued)



Results:

For Opportunistic Funds, an "efficient market" type answer: investors receive a "fair" return, while managers receive the "surplus"

For Value-Added Funds, no such answer: dramatic under-performance

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"Mountain" Chart for Value-Added Index's Alpha

- Repeat the earlier (α) exercise for differing vintages
- Choose any beginning and ending date, with minimum 6-year hold
- Value-add funds underperform before, during & after the financial crisis
  - The pre-financial-crisis underperformance is particularly damning!

Exhibit 78: Value-Added Funds' Estimated Alpha for Various Holding Periods

Incoming Year \ Exiting Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
2007												(3.19%)
2006											(3.05%)	(2.92%)
2005										(2.96%)	(2.74%)	(2.68%)
2004									(1.59%)	(2.45%)	(2.34%)	(2.34%)
2003								(2.82%)	(1.35%)	(2.13%)	(2.07%)	(2.10%)
2002							(1.39%)	(2.50%)	(1.31%)	(2.00%)	(1.97%)	(2.00%)
2001						0.31%	0.06%	(1.62%)	(0.77%)	(1.46%)	(1.47%)	(1.53%)
2000					0.04%	(0.08%)	(0.24%)	(1.83%)	(1.00%)	(1.58%)	(1.58%)	(1.63%)
1999				0.28%	(0.43%)	(0.52%)	(0.65%)	(2.02%)	(1.20%)	(1.70%)	(1.69%)	(1.73%)
1998			NA*	(0.04%)	(1.45%)	(1.56%)	(1.63%)	(2.72%)	(1.88%)	(2.27%)	(2.21%)	(2.21%)
1997		(1.10%)	(0.79%)	(0.95%)	(1.39%)	(1.48%)	(1.59%)	(2.41%)	(1.47%)	(1.87%)	(1.86%)	(1.88%)
1996	(0.89%)	(0.94%)	(0.69%)	(0.87%)	(1.29%)	(1.39%)	(1.48%)	(2.30%)	(1.40%)	(1.77%)	(1.76%)	(1.80%)

Our earlier result

* Not applicable - The reported volatility of the value-added funds during this period is less than that of the core funds for the same period.

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"Mountain" Chart for Opportunistic Index's Alpha

- Repeat the earlier (α) exercise for differing vintages
- The index of Opportunistic funds underperforms before the financial crisis
- Yet, they overperform during & after the financial crisis!
  - How can this be? It cannot [=*f*("flight to quality")]
  - Provides another perspective on data problems & survivorship bias

Exhibit 79: Opportunity Funds' Estimated Alpha for Various Holding Periods

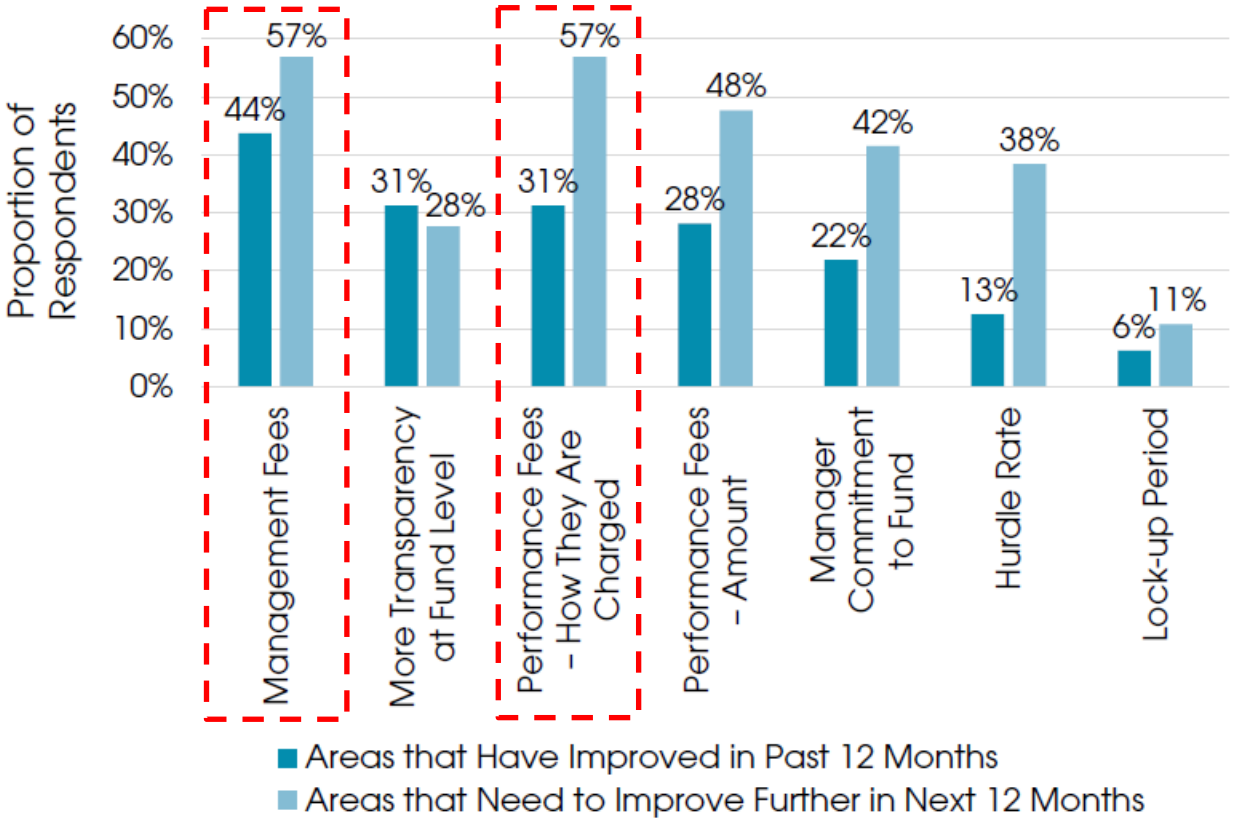
Incoming Year \ Exiting Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
2007												(2.46%)
2006											(2.46%)	(2.86%)
2005										3.96%	0.51%	(0.37%)
2004									7.22%	4.60%	1.52%	0.60%
2003								(0.88%)	6.19%	4.05%	1.39%	0.58%
2002							(3.78%)	(0.32%)	5.46%	3.62%	1.26%	0.53%
2001						0.76%	(1.54%)	0.36%	5.04%	3.42%	1.27%	0.60%
2000					(0.41%)	(0.65%)	(2.47%)	(0.46%)	4.14%	2.78%	0.89%	0.31%
1999				(1.52%)	(2.24%)	(2.38%)	(3.87%)	(1.54%)	3.03%	1.90%	0.24%	(0.25%)
1998			(0.47%)	(2.38%)	(3.71%)	(3.81%)	(4.95%)	(2.53%)	2.18%	1.23%	(0.24%)	(0.66%)
1997		(1.99%)	(1.66%)	(2.27%)	(3.50%)	(3.60%)	(4.68%)	(2.31%)	2.41%	1.52%	0.11%	(0.31%)
1996	(2.00%)	(1.26%)	(1.11%)	(1.64%)	(2.78%)	(2.95%)	(3.93%)	(1.84%)	2.66%	1.82%	0.48%	0.06%

Our earlier result

Investor Satisfaction with Fund Terms?

- **Areas of improvement (and LP satisfaction/dissatisfaction):**

Fig. 4.19: Areas of Fund Terms Investors Feel Have Shown the Most Improvement over the Past 12 Months and that Need to Improve Further in the Next 12 Months



Source: Preqin Investor Interviews, June 2016

Some Thoughts on Winners & Losers: Agenda

- **Winning Arguments:**
  - The components of return
  - JVs as principal/agent problems
  - The drag of transaction costs
  - Core *v.* non-core performance

- Losing Arguments (at least for now):
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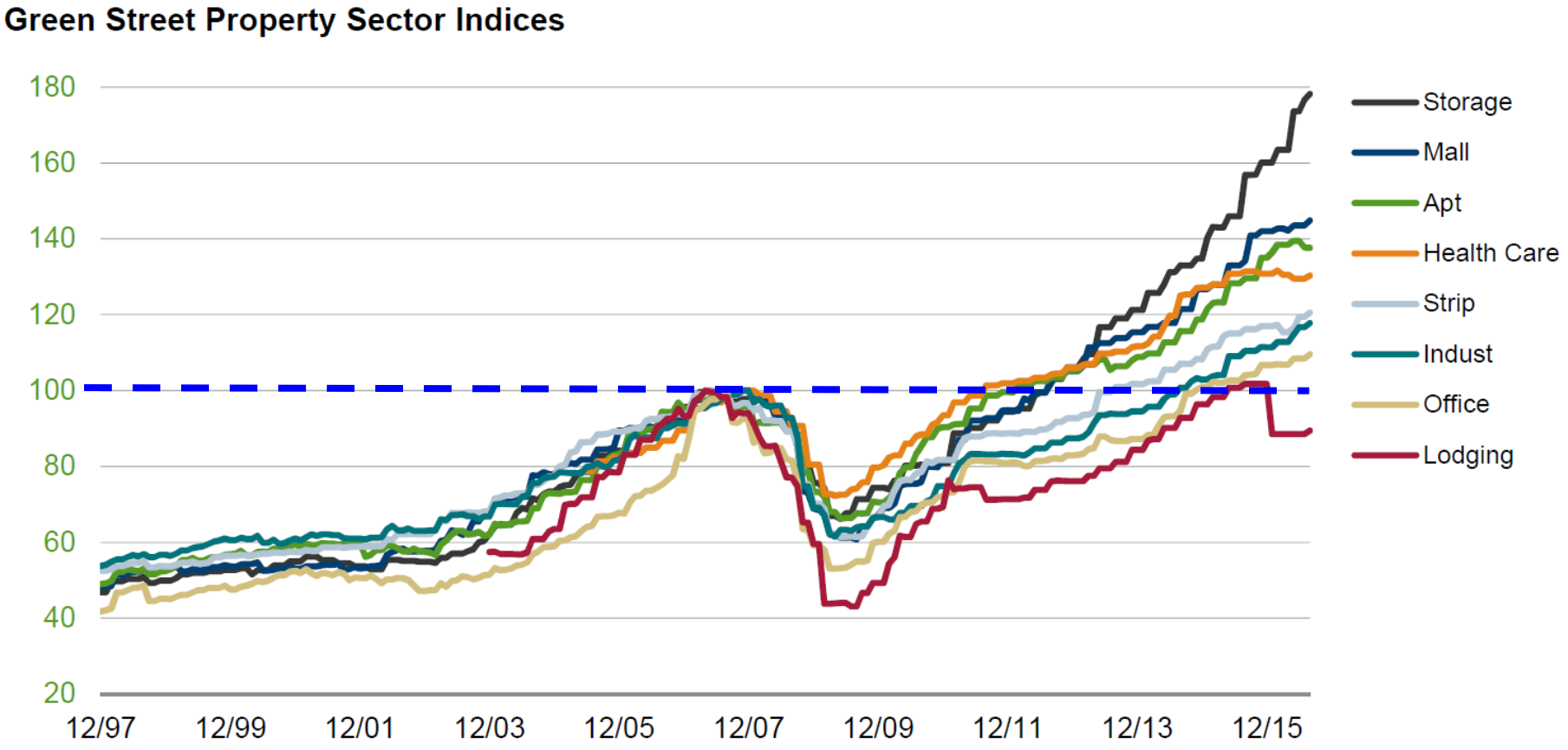
Is CRE in "Bubble" Territory?

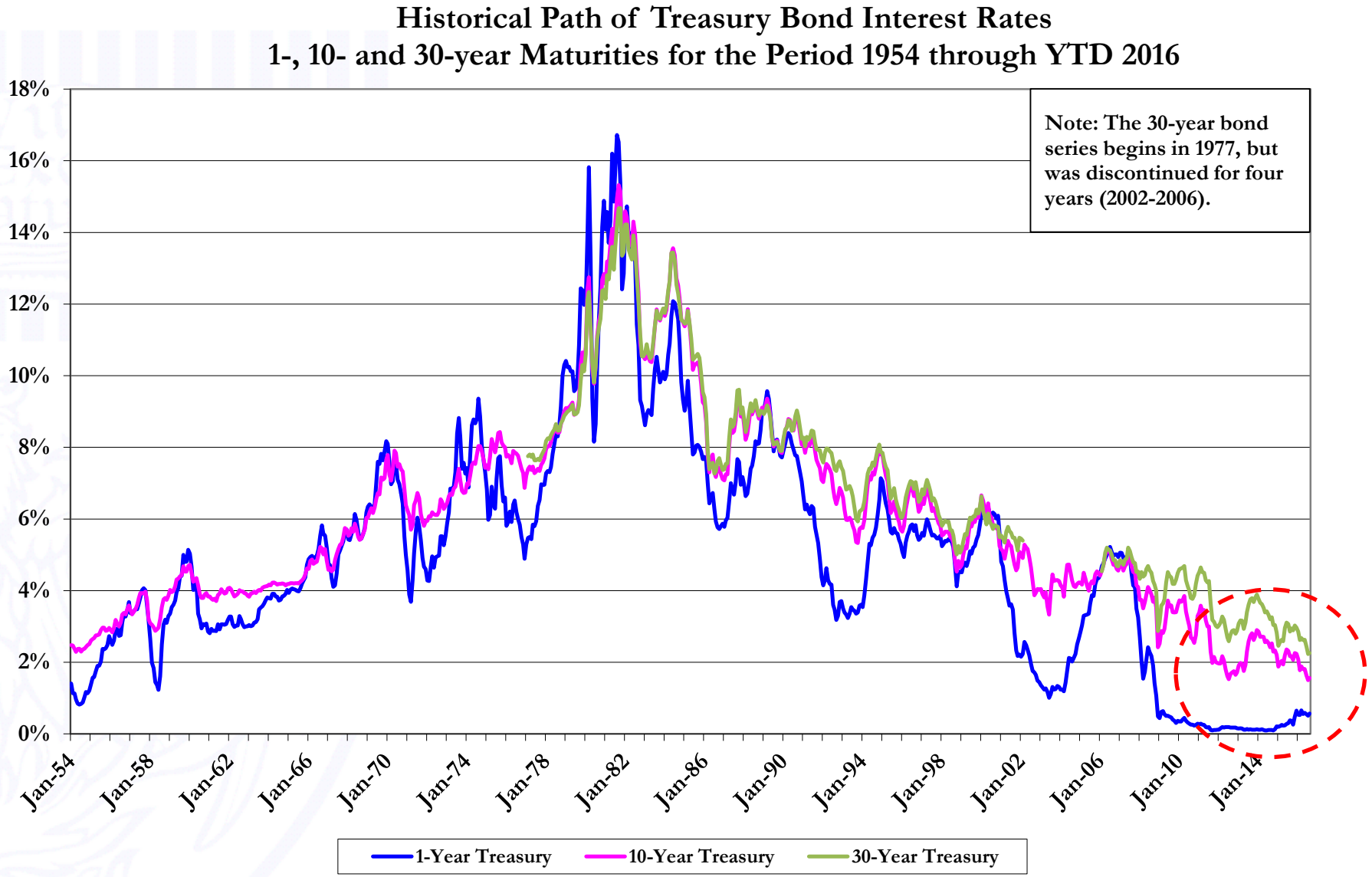
- How should we view the level of CRE prices?



Property sector indices are indexed to 100 at their '07 peaks.

Source: Green Street Advisors, Commercial Property Price Index, September 7, 2016.

Some Historical Context



Valuations & Interest Rates

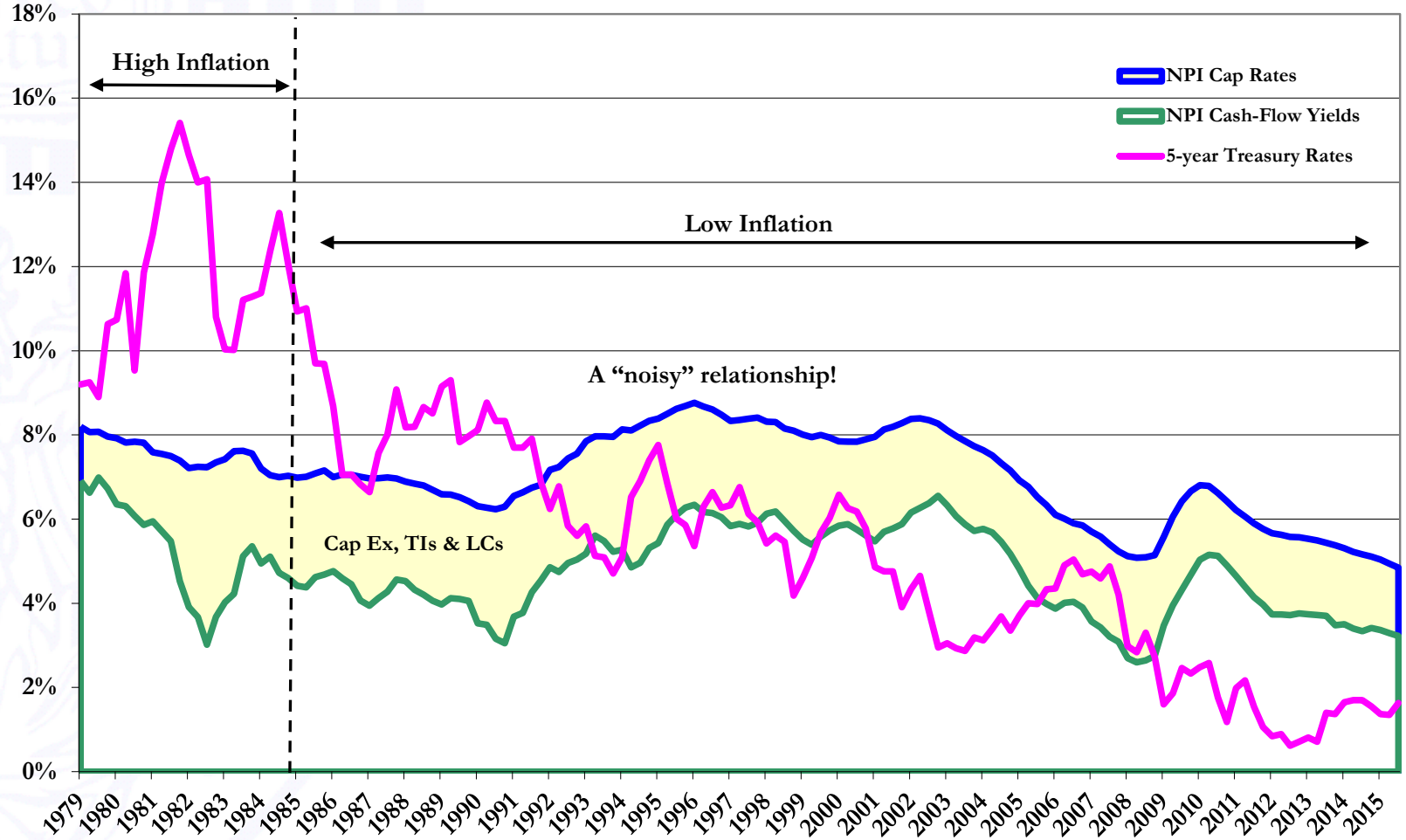
- Some investors naively assume:
  - Interest Rates ↑ → Asset Prices ↓
- However, a change in interest rates = $f(\bullet)$:
  - a change in inflation (ρ) expectations, and/or
  - a change in the real return (r) requirement.
- These two factors can have very different impacts on asset values:
  - Inflation ↑ → Interest Rates ↑ → Asset Prices ↑
  - Real Return ↑ → Interest Rates ↑ → Asset Prices ↓

- Inflationary increases may be favorable for real estate
- Real return increases may be unfavorable for most all asset classes, including real estate

History: Current Return *v.* Interest Rates

- A comparison of cap rates & cash-flow yields v. 5-year Treasury rates:

Comparison of 5-year US Treasury Rates to NCREIF Cap Rates
& Cash-Flow Yields for the Quarterly Periods 1979-2015



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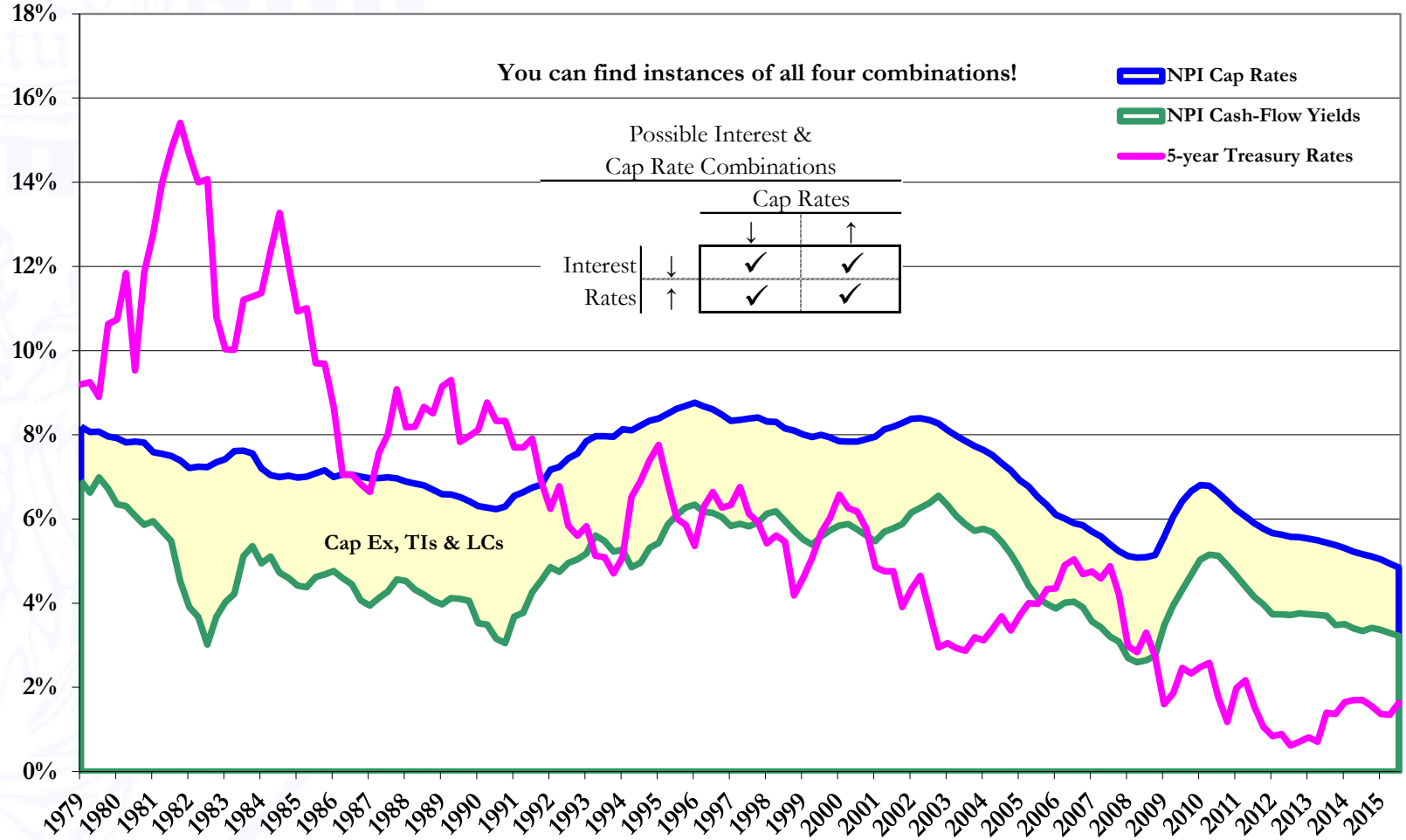
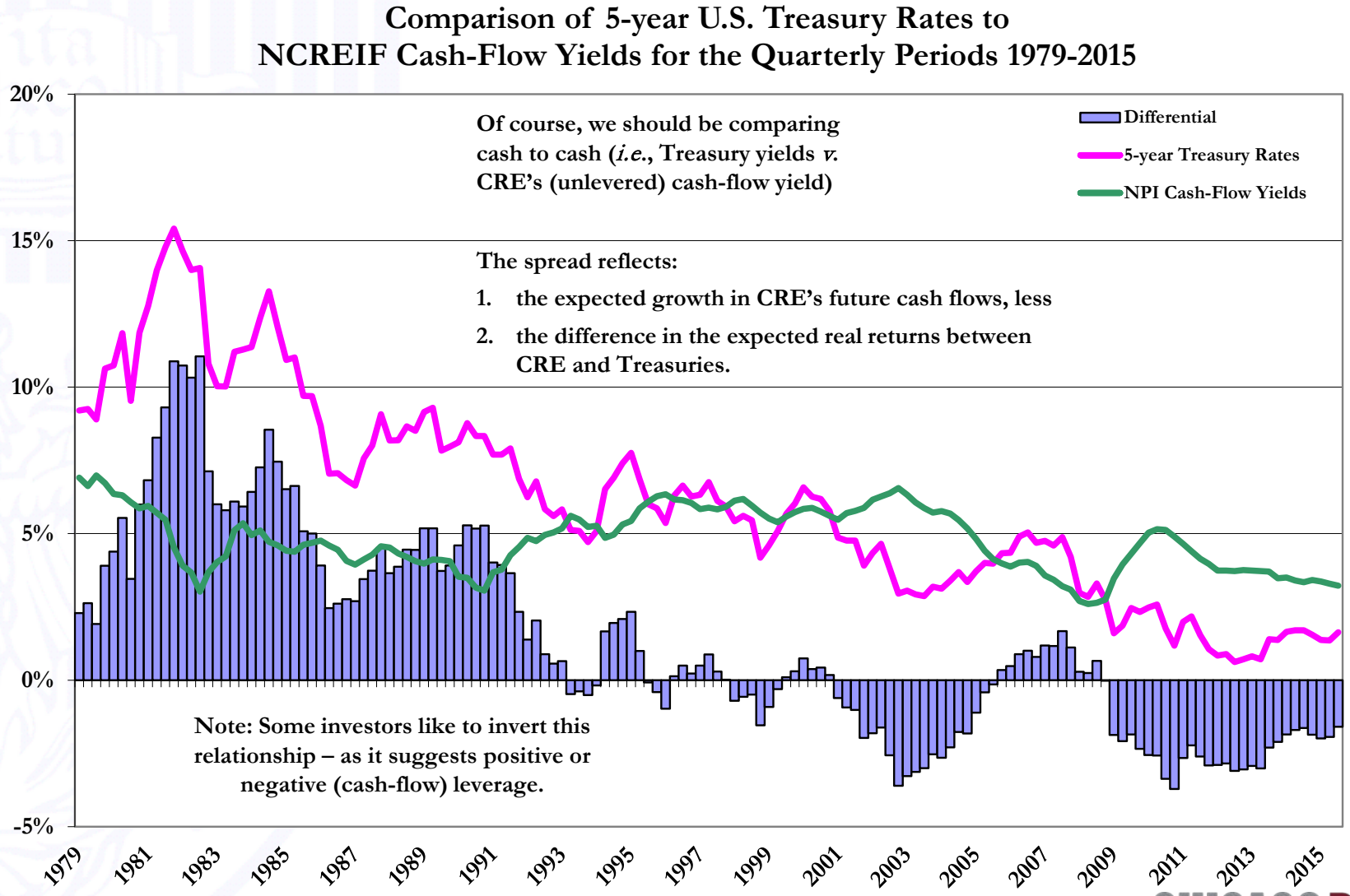


History: Interest Rates *v.* Current Return

- **The differential highlights that these are fundamentally different securities:**



Conceptual: Interest Rates *v.* Current Return

- What does the difference (δ) between bond rates (i/P_0) and real estate's cash-flow yields (CF_1/P_0) imply?

- Fundamentally, this is a comparison between a fixed-rate, nominal-yield security and a variable-rate, real-yield security.

- More specifically, the difference equals:

  - expected RE's growth (g) in cash flow <u>less</u>
  - the difference in:
    - RE's expected real return (r_{RE}), and
    - Treasury bonds' expected real return (r_{TB}).

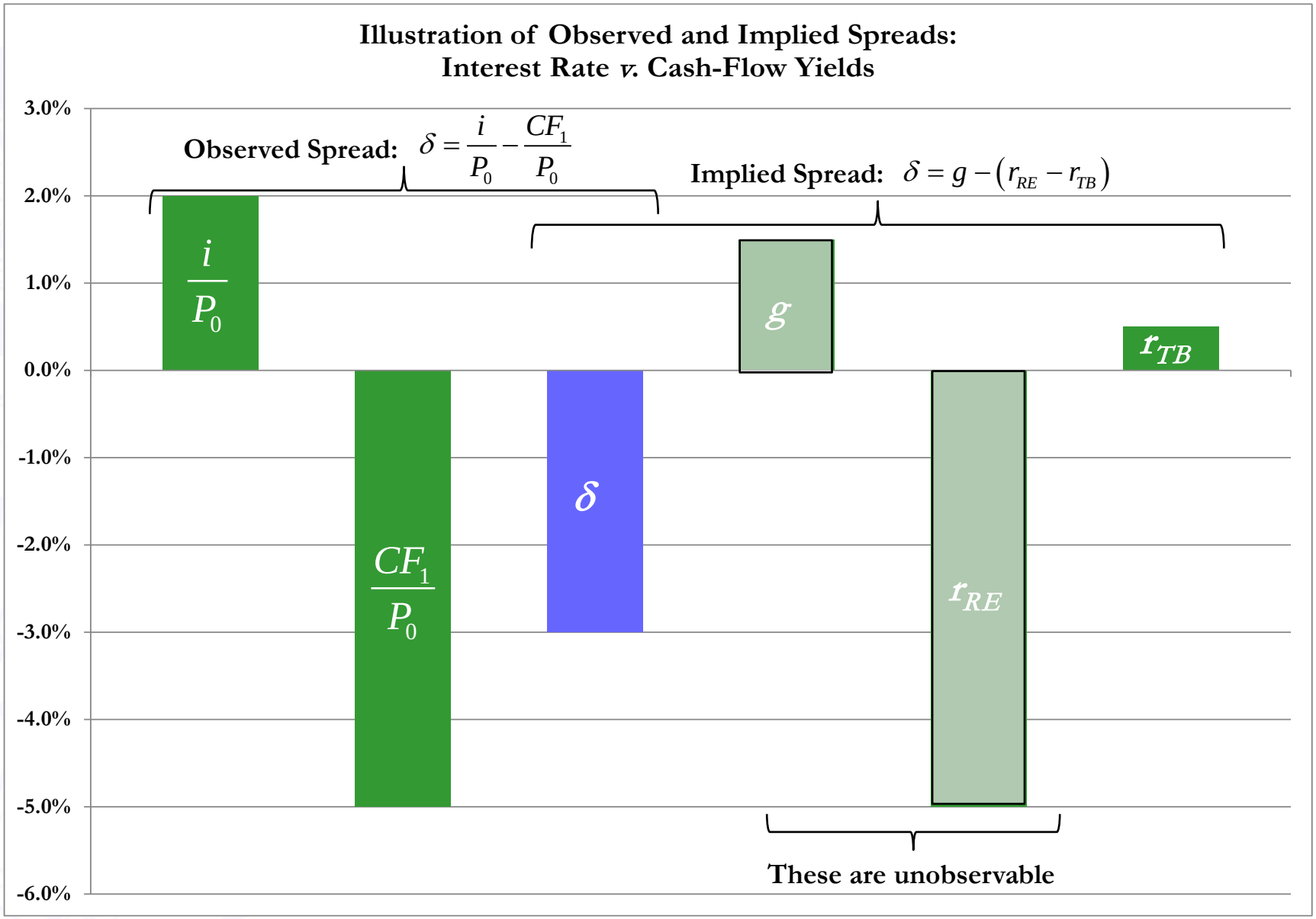
$$\delta = g - (r_{RE} - r_{TB})$$

Illustration: Interest Rates *v.* Current Return

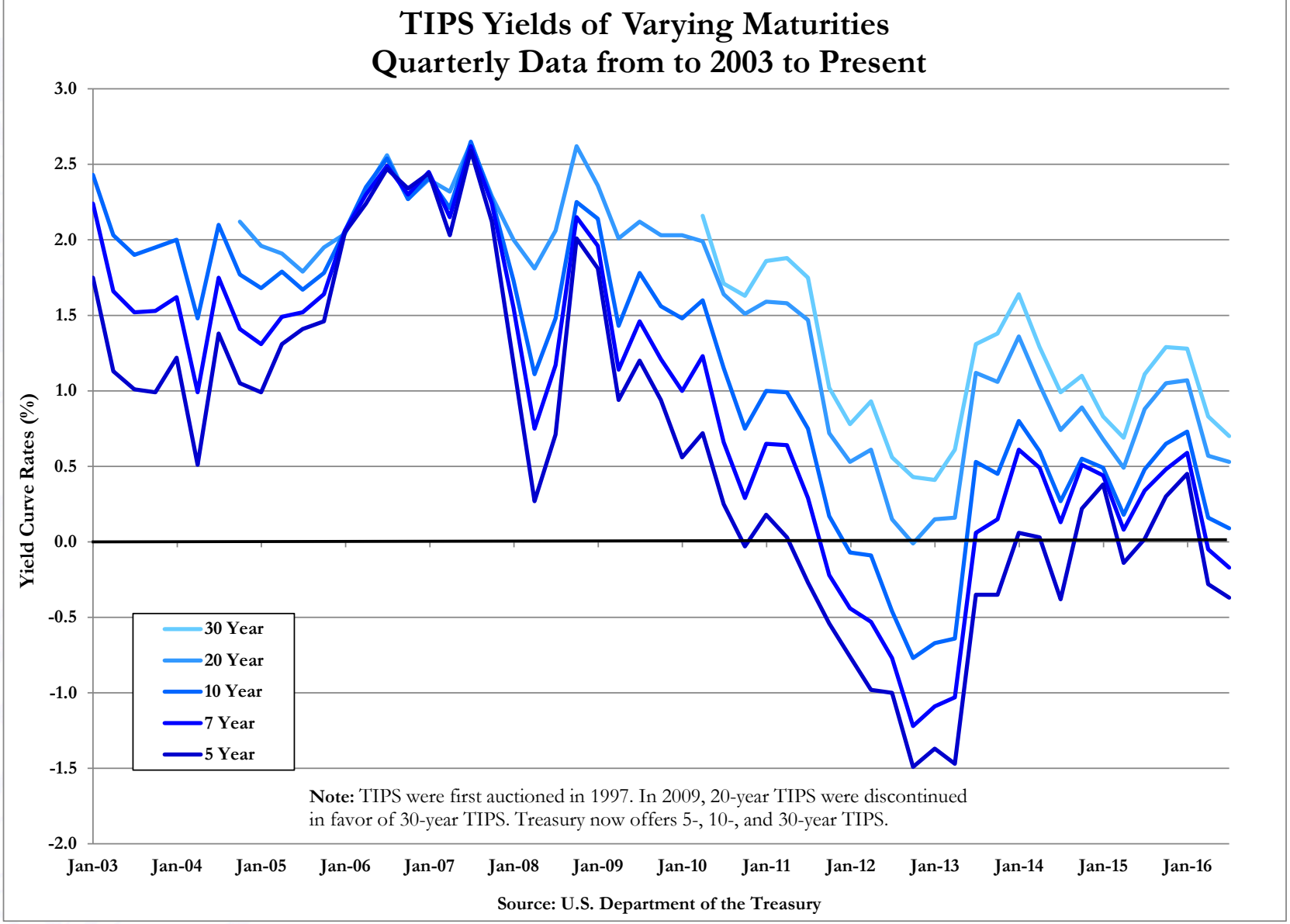
- As an illustration, assume:
  - bond rates (i/P_0) = 2.0%
  - real estate's cash-flow yields (CF_1/P_0) = 5.0%
- ∴ the observed difference (δ) = 2.0% - 5.0% = <3.0%>
- Further assume:
  - real estate's expected cash-flow growth (g) = 1.5%
  - real estate's real return (r_{RE}) = 5.0%,
  - Treasury bond's real return (r_{TB}) = 0.5%
- ∴ the implied difference (δ) = 1.5% - (5.0% - 0.5%) = <3.0%>

- Also assumes that RE's growth rate equals the inflation rate ($g = \rho$)

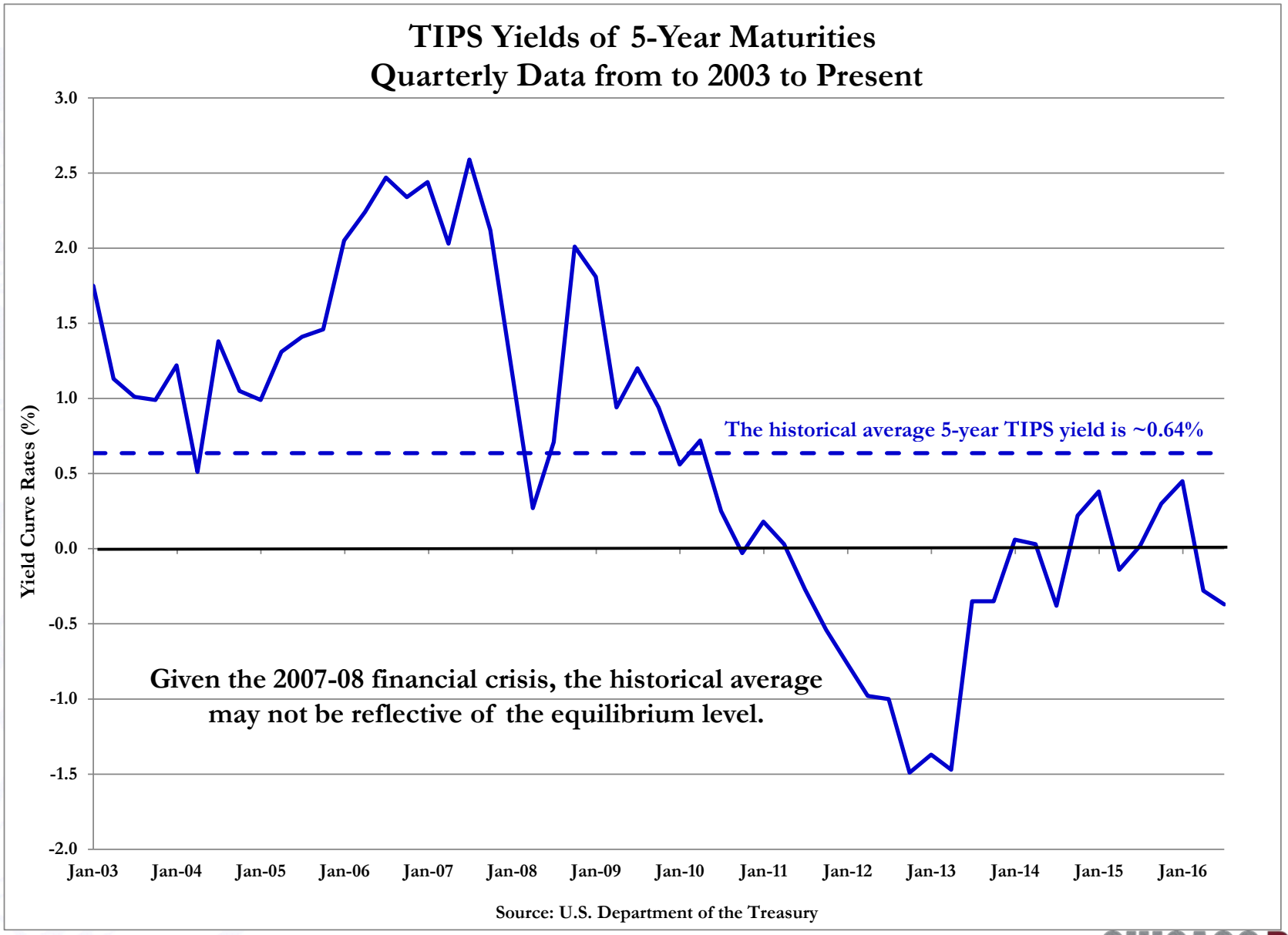
Illustration: Interest Rates *v.* Current Return



An Aside: The Path of TIPS Rates



An Aside: The Path of TIPS Rates (continued)



Technical: Interest Rates *v.* Current Return (continued)

- Before considering the difference (δ) between bond rates (i/P_0) and real estate's cash-flow yields (CF_1/P_0), we need two relationships:

- The nominal (k) and real (r) returns on any asset are linked by:

$$k = (1+r)(1+\rho) - 1$$

  - where inflation (ρ) is the link between nominal and real returns.

- The total (nominal) return on real estate is also given by:

$$k_{RE} = \frac{CF_1}{P_0} + g$$

  - This assumes constant cap rates.

- Let's use these relationships to examine δ

Technical: Interest Rates *v.* Current Return

- **Consider:**

$$\delta = \frac{i}{P_0} - \frac{CF_1}{P_0}$$

Recall: $k_{RE} = CF_1/P_0 + g \rightarrow CF_1/P_0 = k_{RE} - g$

$$= \frac{i}{P_0} - \left(k_{RE} - g\right)$$

Rewrite such that $k = (1+r)(1+\rho) - 1$

$$= \left(1 + r_{TB}\right)\left(1 + \rho\right) - 1 - \left[\left(1 + r_{RE}\right)\left(1 + \rho\right) - 1 - g\right]$$

Eliminate & collect terms

$$\approx g - \left(r_{RE} - r_{TB}\right)$$

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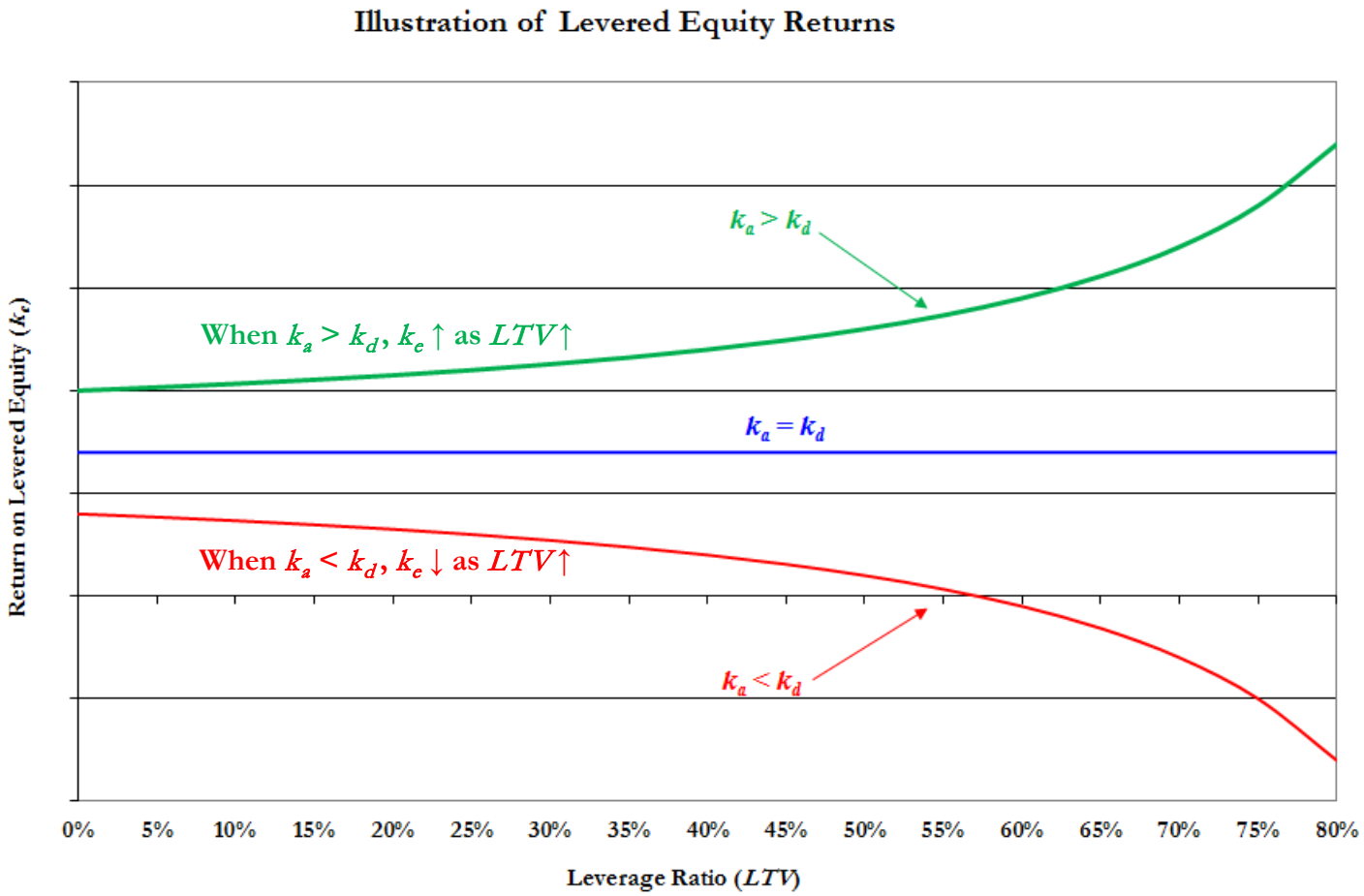
Recall: The Return on Levered Equity

- **The return on levered equity (k_e) can be written as:**

$$k_e = \frac{k_a - k_d LTV}{1 - LTV}; \text{ where: } k_a = \text{(unlevered) asset return}$$



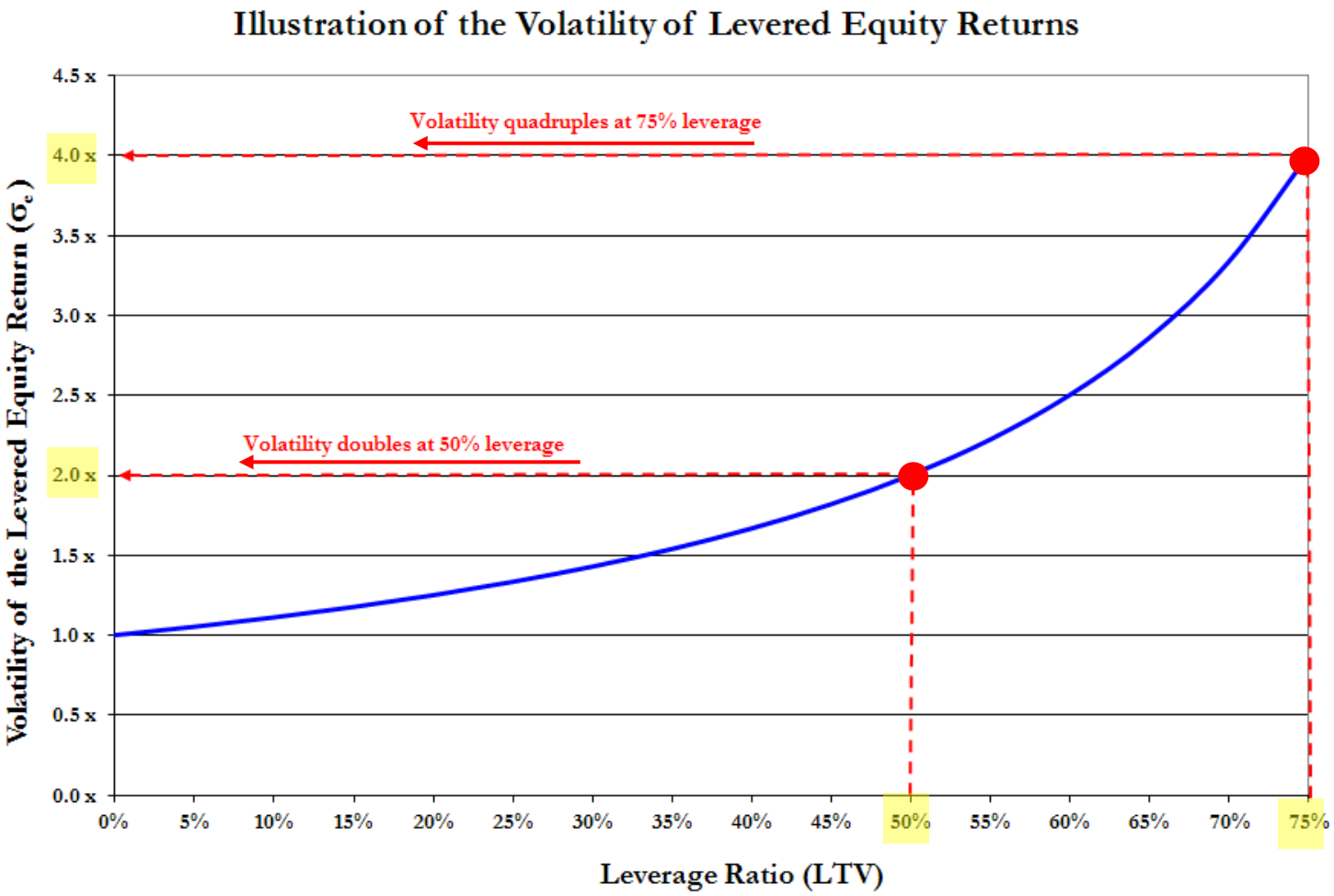
Note:

This illustration assumes the traditional approach that k_d is constant across all LTVs – an approach we'll revisit

Recall: The Volatility of Levered Equity Returns

- **The volatility of levered equity returns (σ_e) can be written as:**

$$\sigma_e = \frac{\sigma_a}{1 - LTV}$$; where: σ_a = volatility of (unlevered) asset returns

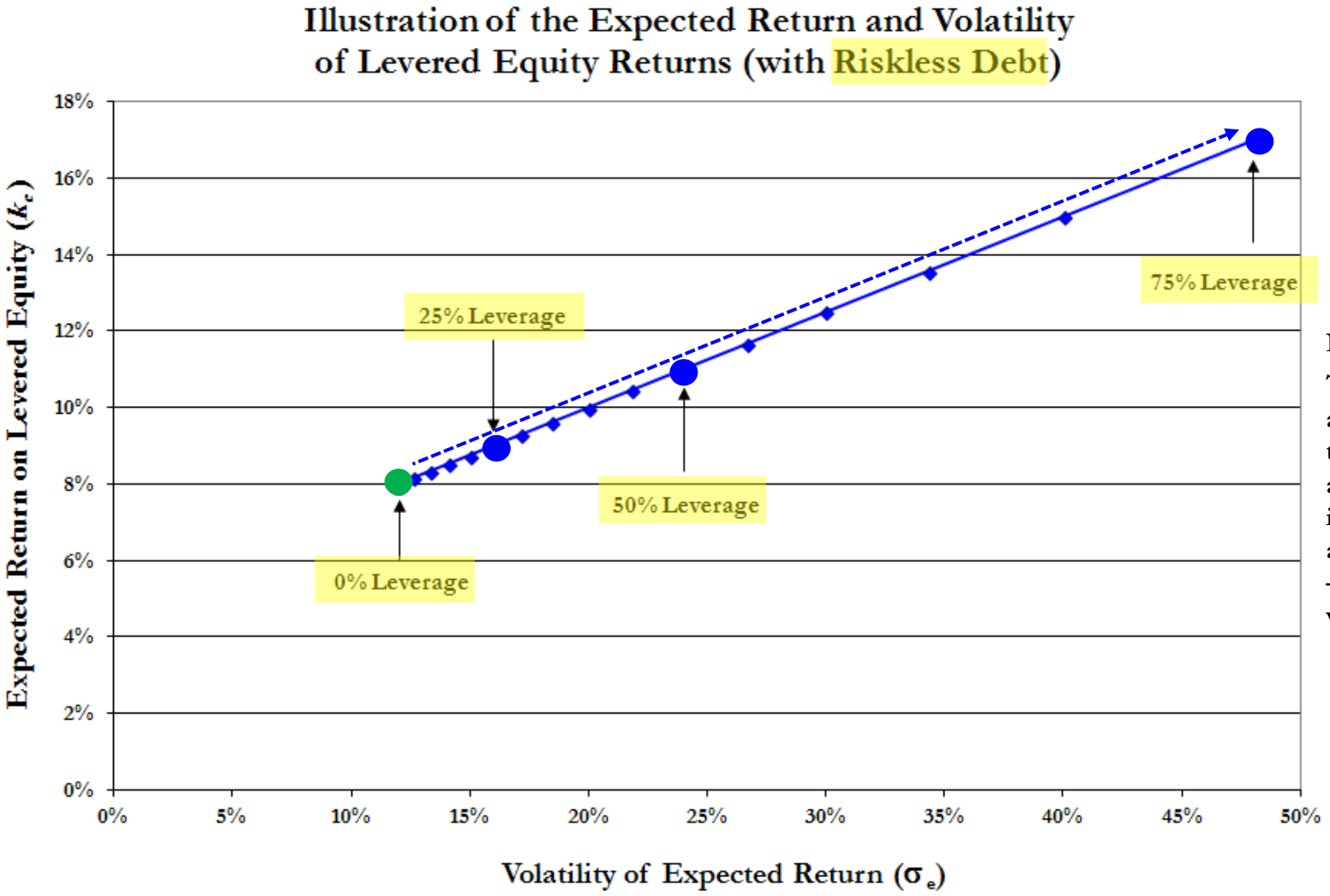


Note:

This illustration assumes fixed-rate financing

Recall: Combining Risk & Return

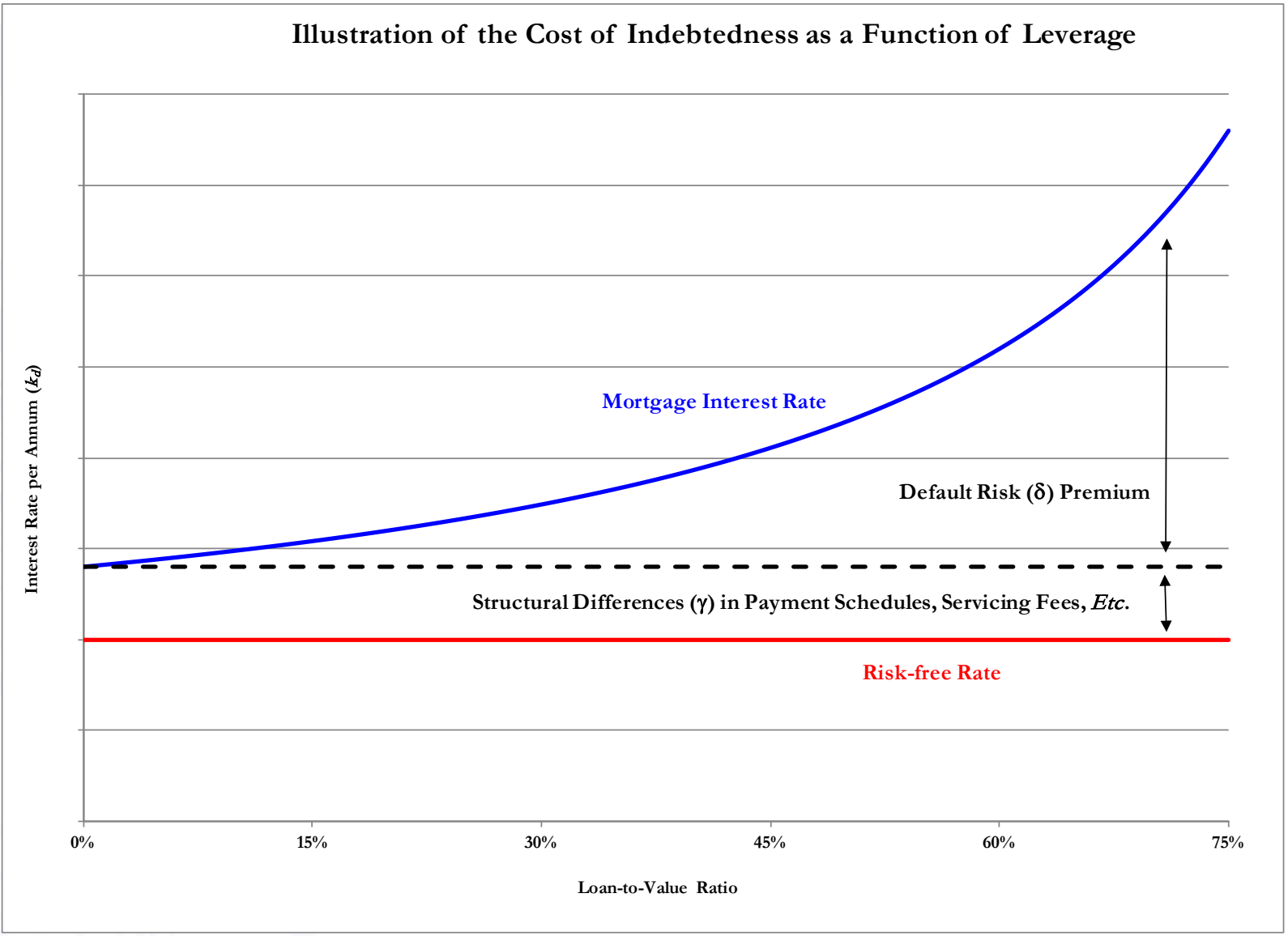
- Let's assume: $\kappa_a = 8\%$ and $\sigma_a = 12\%$
- Then, can lever up core to create risk/return continuum



Note:

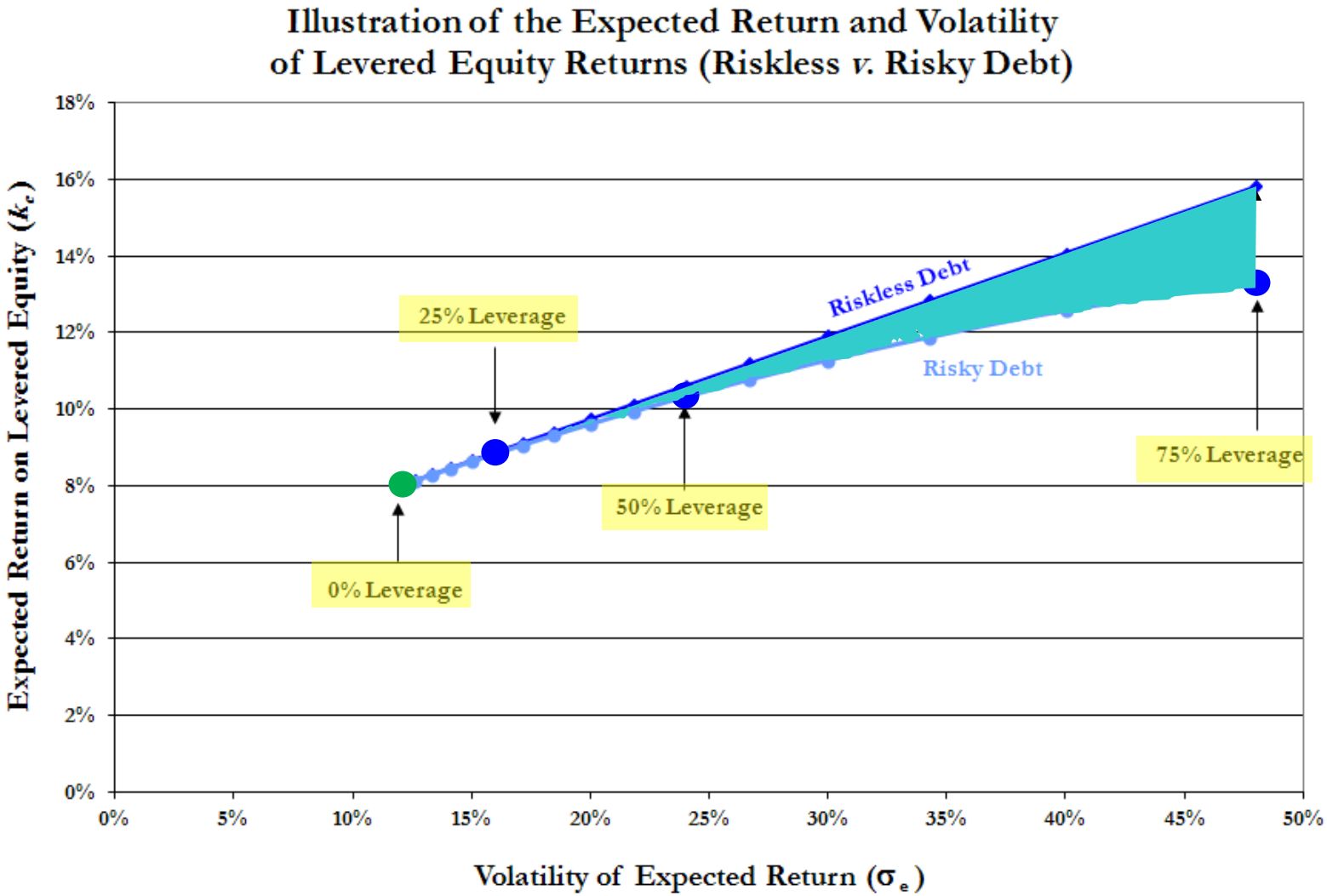
This illustration assumes the traditional approach that k_d is constant across all *LTV*s – an approach we'll revisit

Recall: Interest Rates = $f(LTV|$ Asset Quality, Sponsorship, *etc.*)

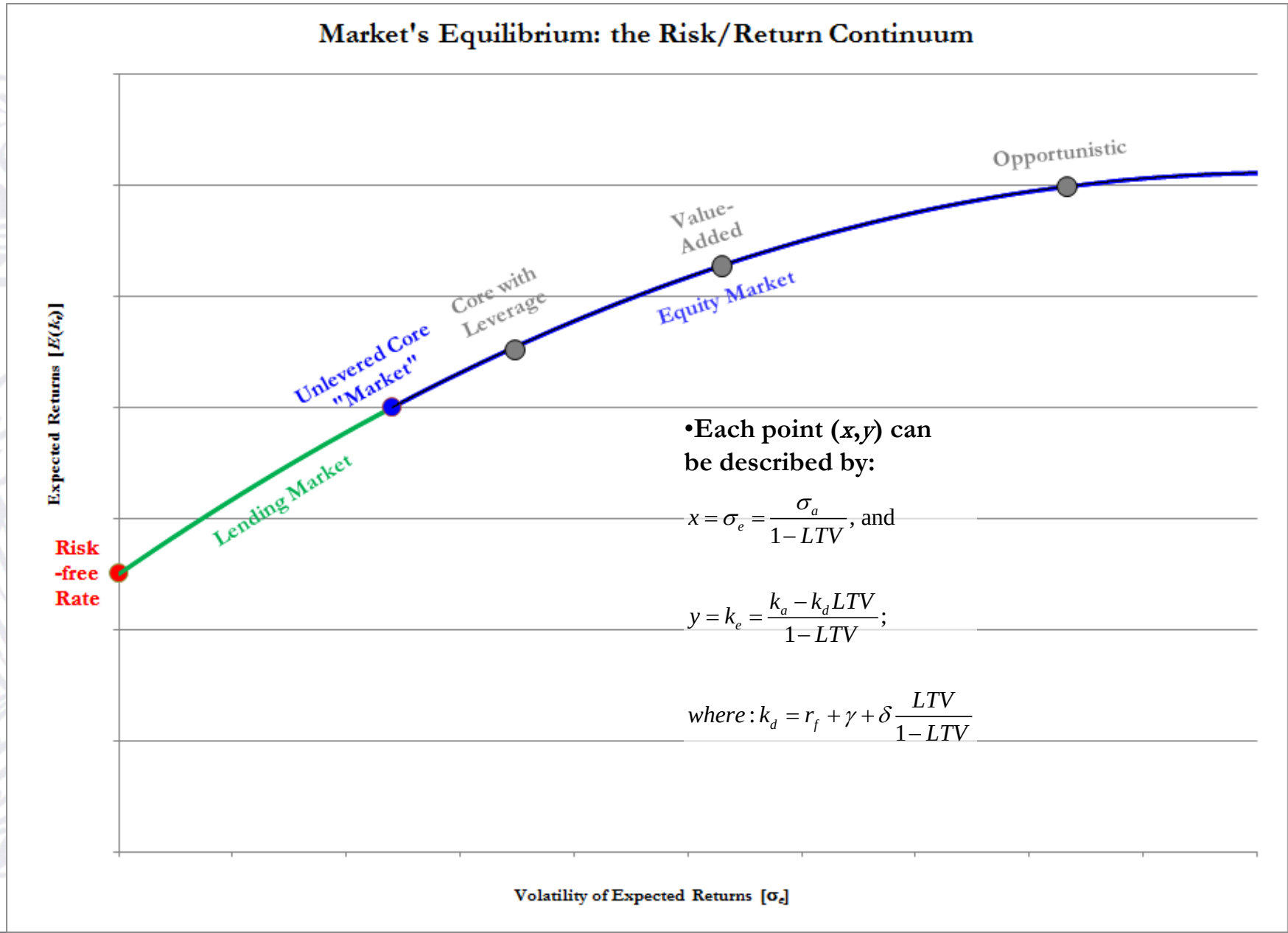


Modifying Risk & Return Continuum ← Risky Debt

- As before, let's assume: $\kappa_a = 8\%$ and $\sigma_a = 12\%$
- With risky debt [$=f(LTV)$], continuum becomes a curve

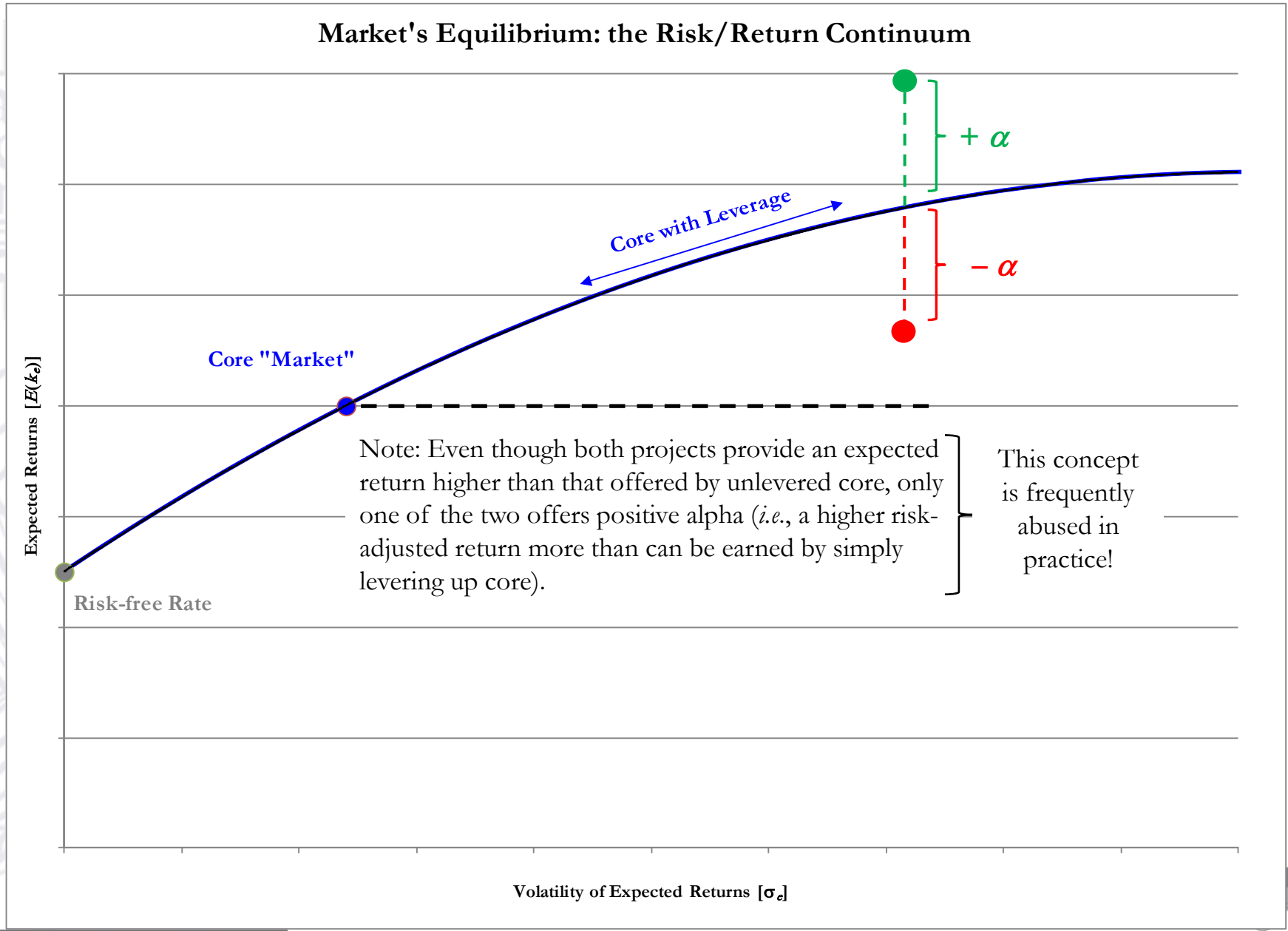


The Equilibrium Condition: The Law of One Price

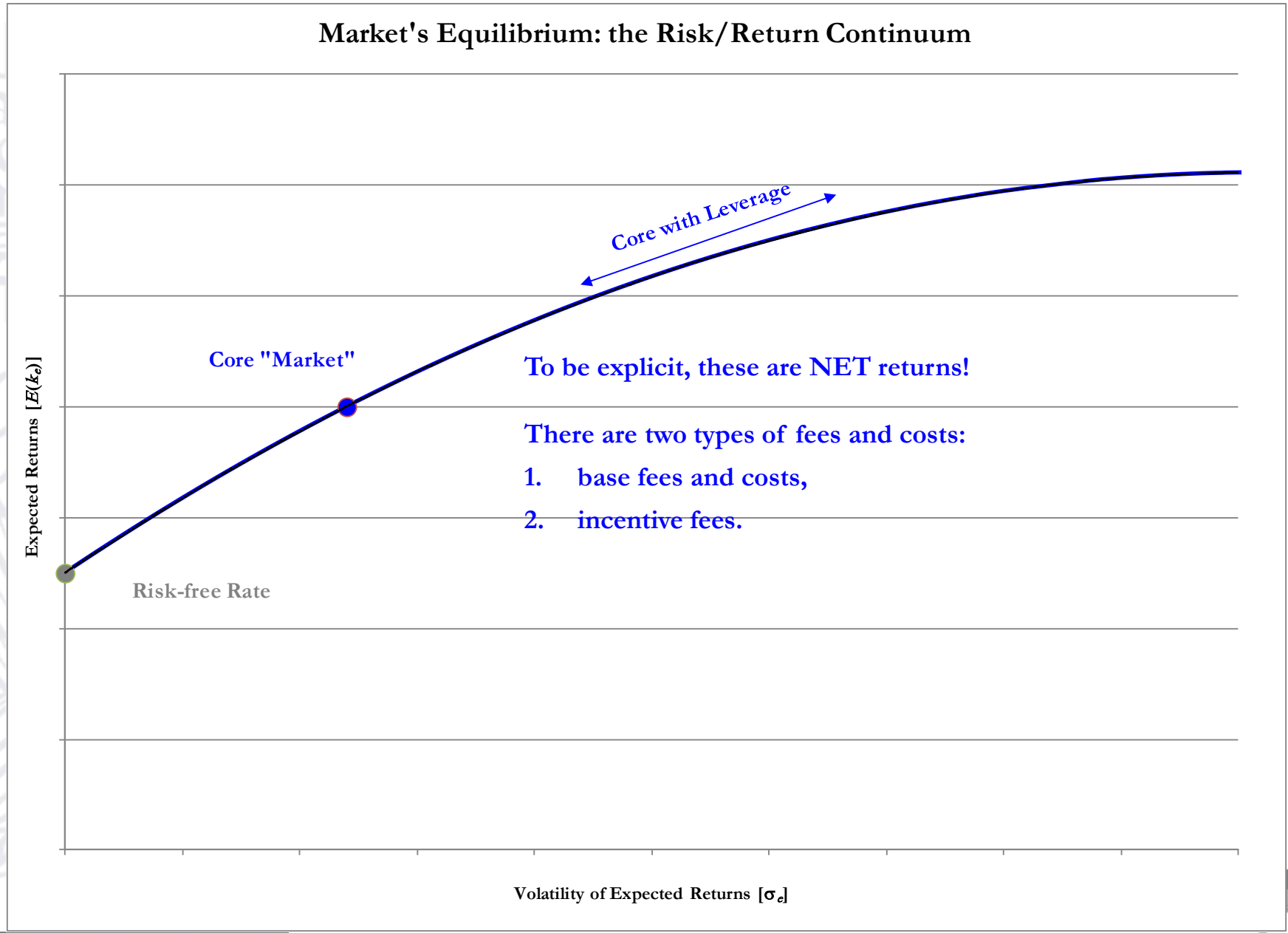


The Equilibrium Condition → Alpha!

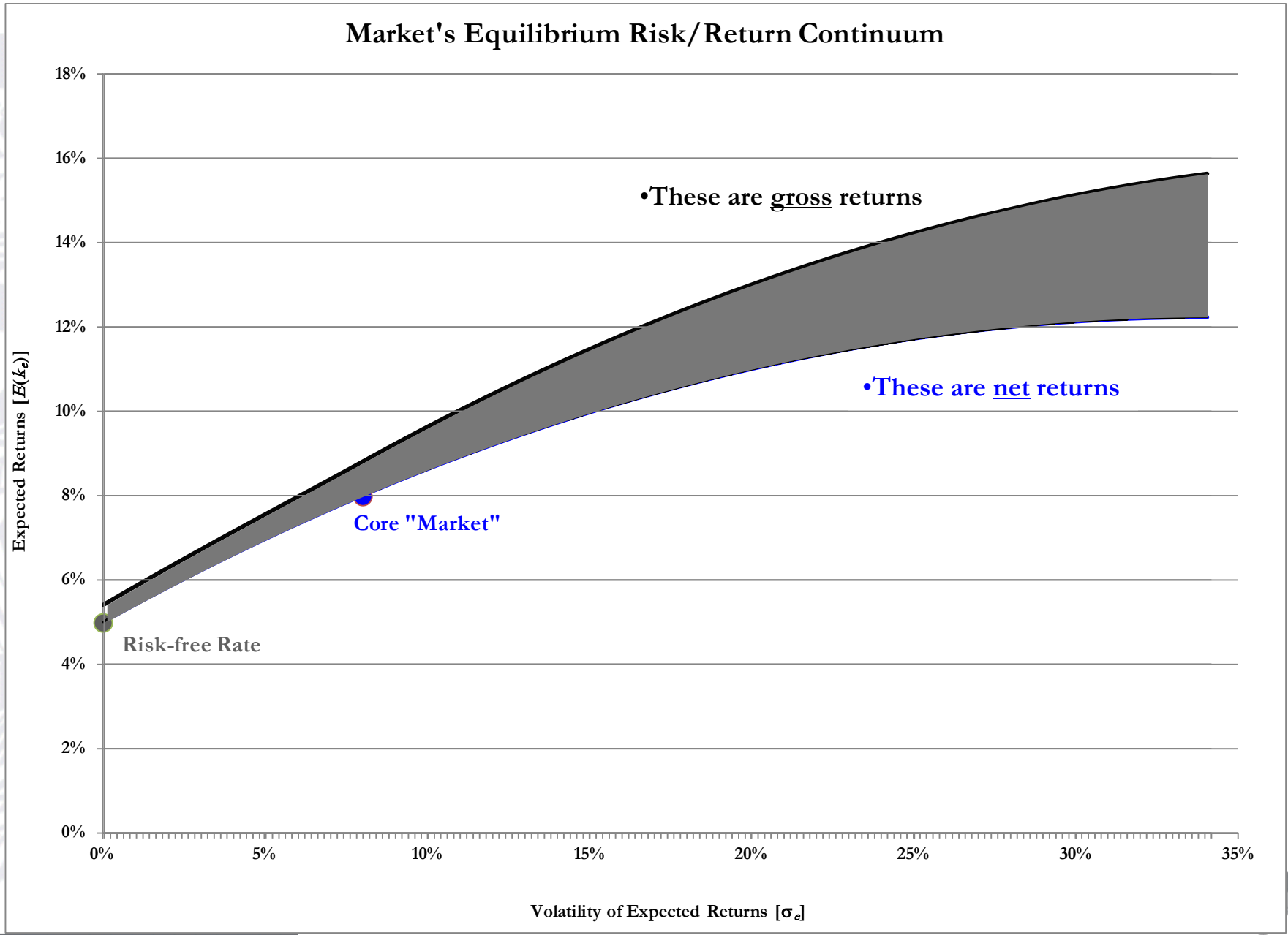
Let's look at two possible deals



The Equilibrium Condition ← Net Returns

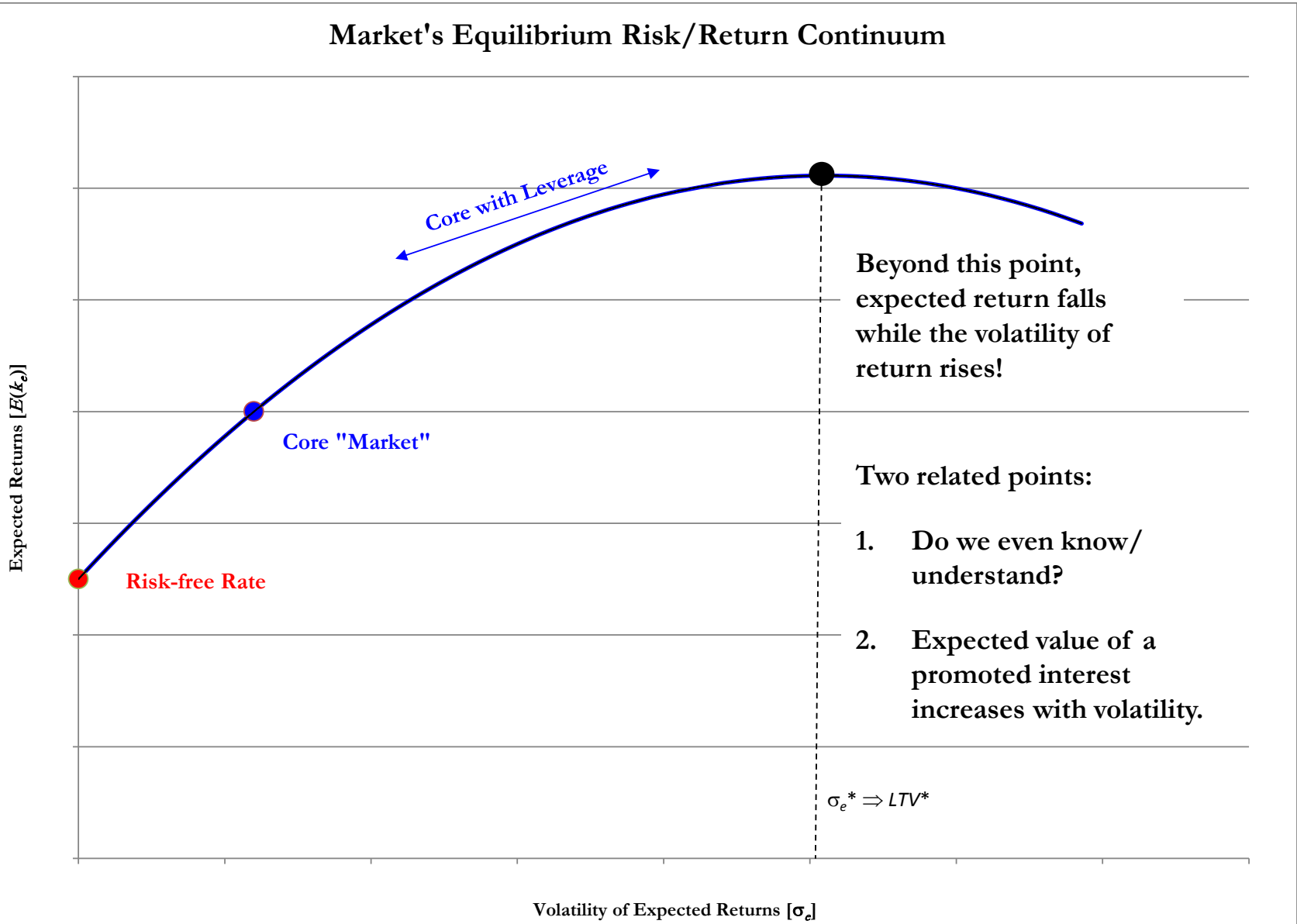


The Equilibrium Condition ← Net Returns (continued)



An Aside: Too Much Leverage

When the lender's risk aversion is high (and, therefore, loan spreads are high), high LTVs can be too much of a good thing!



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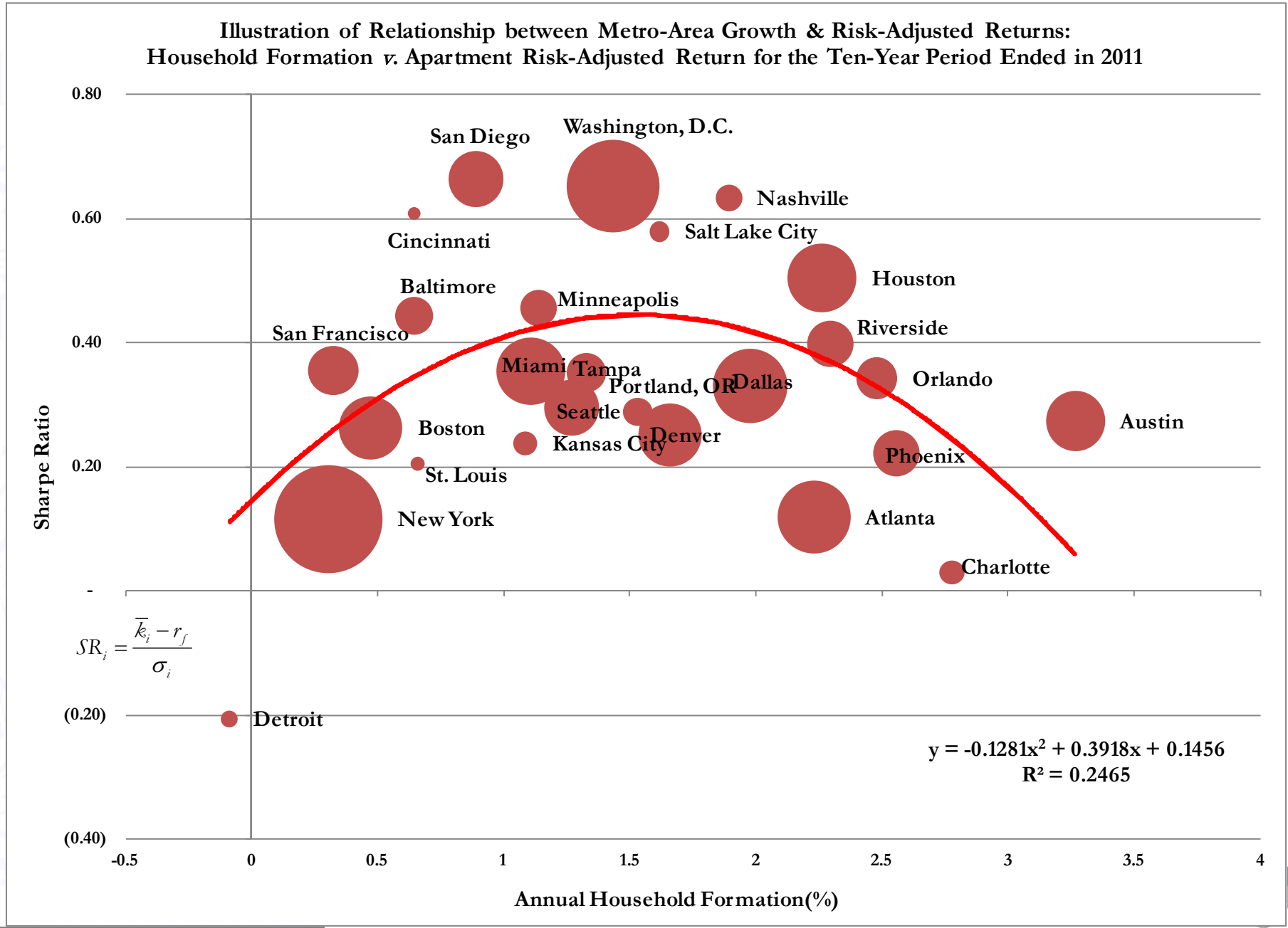
Growth: Too Much of a Good Thing?



Too Much Growth → Land as an Option

Today's land value is a call option on future development opportunities:

$$\text{Land Value}_{t} = \max[0, \text{Building Value}_{t+j} - \text{Building Cost}_{t+j}]$$

This option-pricing perspective leads to following results:*

Land value is always greater than zero

$$\text{Land Value}_{t} > 0$$

Land volatility of value is substantially greater than building volatility:

$$\sigma_{\text{Land Value}} \approx 3\,\sigma_{\text{Building Value}}$$

* Notwithstanding several underlying assumptions.

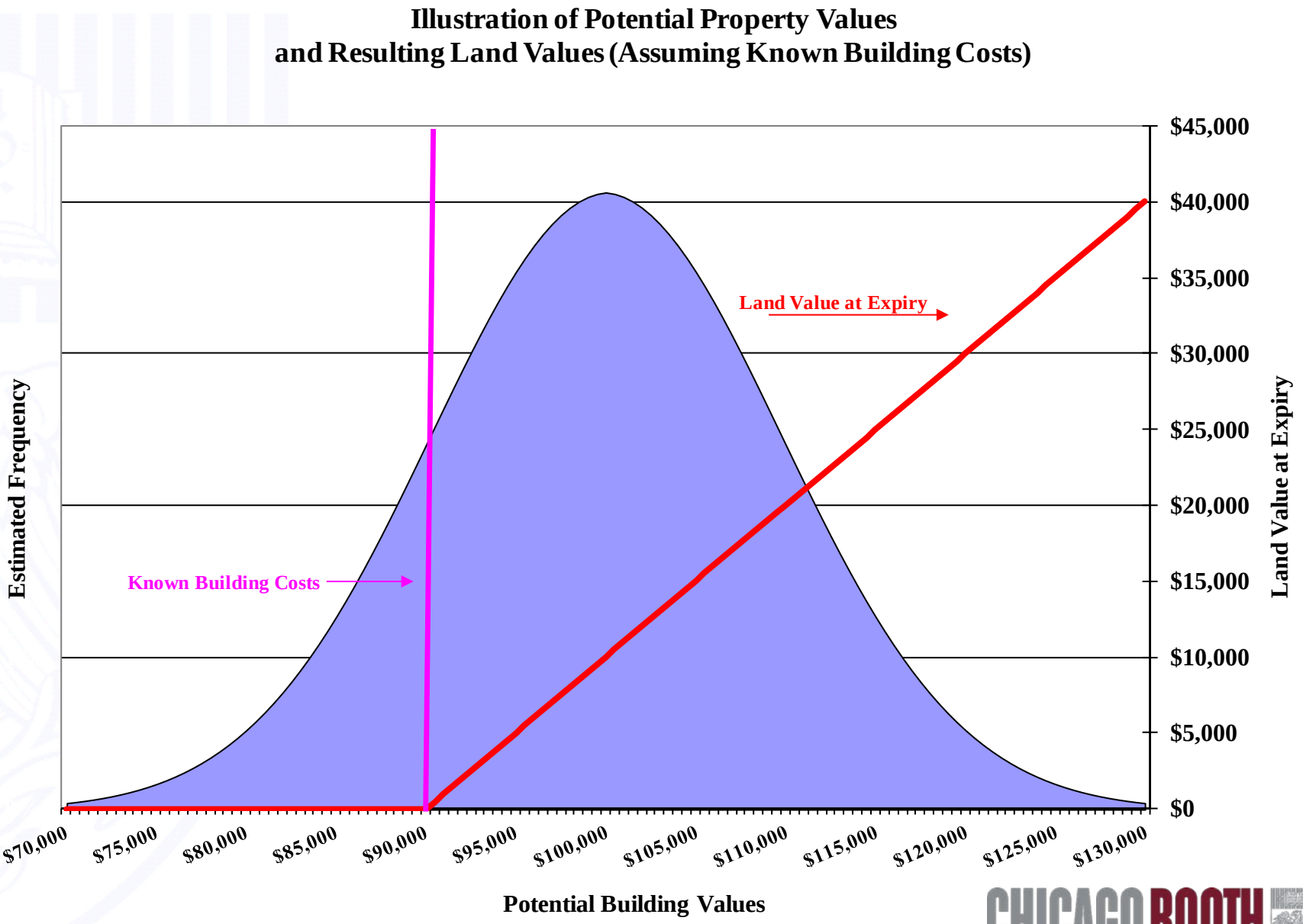
Land as an Option → A Simple Example

- Some simple assumptions:
  - E[Building Value $_{t+j}$] = \$100 million

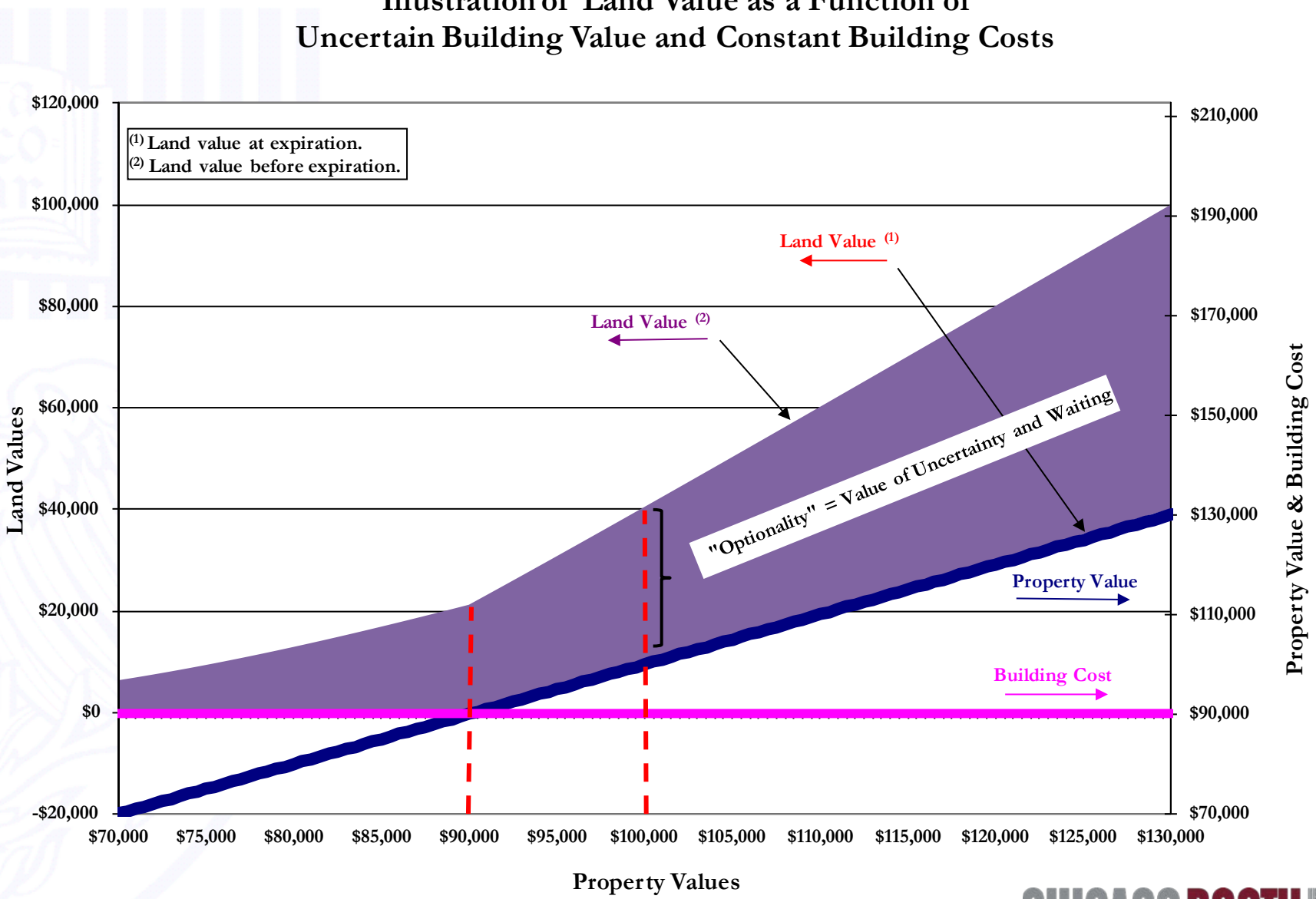
    $\sigma_{E[\text{Building Value } t+j]}$ = \$10 million
  - E[Building Cost $_{t+j}$] = \$90 million *
    - Holding Period (j) = 5 years
      - Risk-free Rate = 5%
- Result in the following graphical illustrations:

* Including developer's "fair" profit.

Development as an Option [1]



Development as an Option [2]



What About the Discount to Replacement Cost?

- **The premium/discount to replacement cost:**

$$\frac{\text{Building Value}}{\text{Replacement Cost}} = \frac{\text{Building Value}}{\text{Building Cost} + \text{Land Value}}$$

- **It is a well-worn metric for many practitioners, with regard to both development and acquisitions.**

All Properties Trade at a Discount to Replacement Cost!

- **Let's take a closer look:**

$$\frac{\text{Building Value}_t}{\text{Replacement Cost}_t} = \frac{\text{Building Value}_t}{\text{Building Cost}_t + \text{Land Value}_t}$$

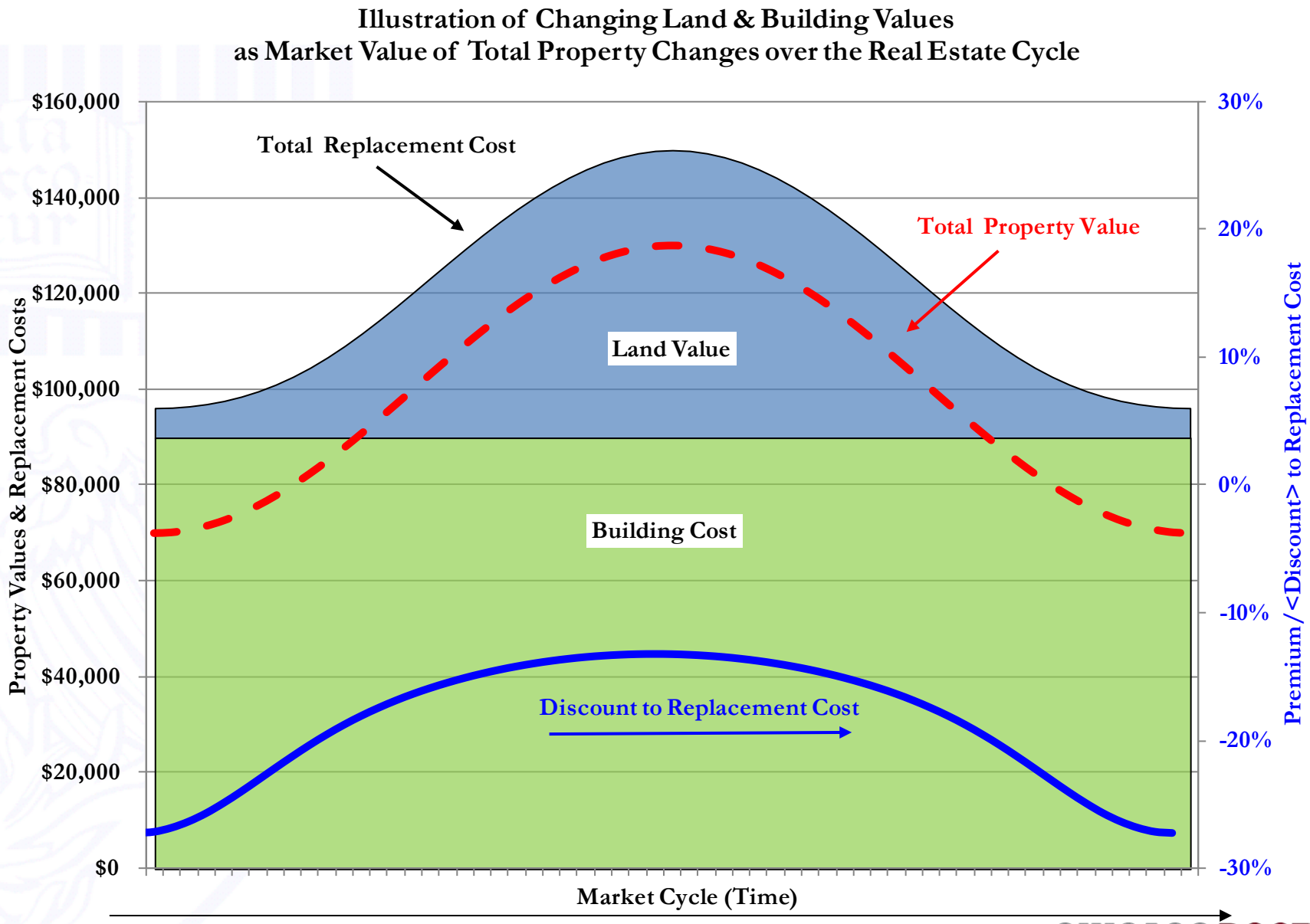
$$= \frac{\text{Building Value}_t}{\text{Building Cost}_t + \max\left[0, \text{Building Value}_{t+j} - \text{Building Cost}_{t+j}\right]}$$

$$= \frac{\text{Building Value}_t}{\text{Building Cost}_t + \text{Building Value}_{t+j} - \text{Building Cost}_{t+j} + \text{"}optionality\text{"}}$$

$$= \frac{\text{Building Value}_t}{\text{Building Value}_{t+j} - \left(\text{Building Cost}_{t+j} - \text{Building Cost}_t\right) + \text{"}optionality\text{"}}$$

< 1

And, It Doesn't Matter Where in the Cycle!



Not Merely an Academic Exercise!

Consider the CalPERS experience:

[◯ > 40% loss]

Performance of Calpers' Residential-Land Ventures

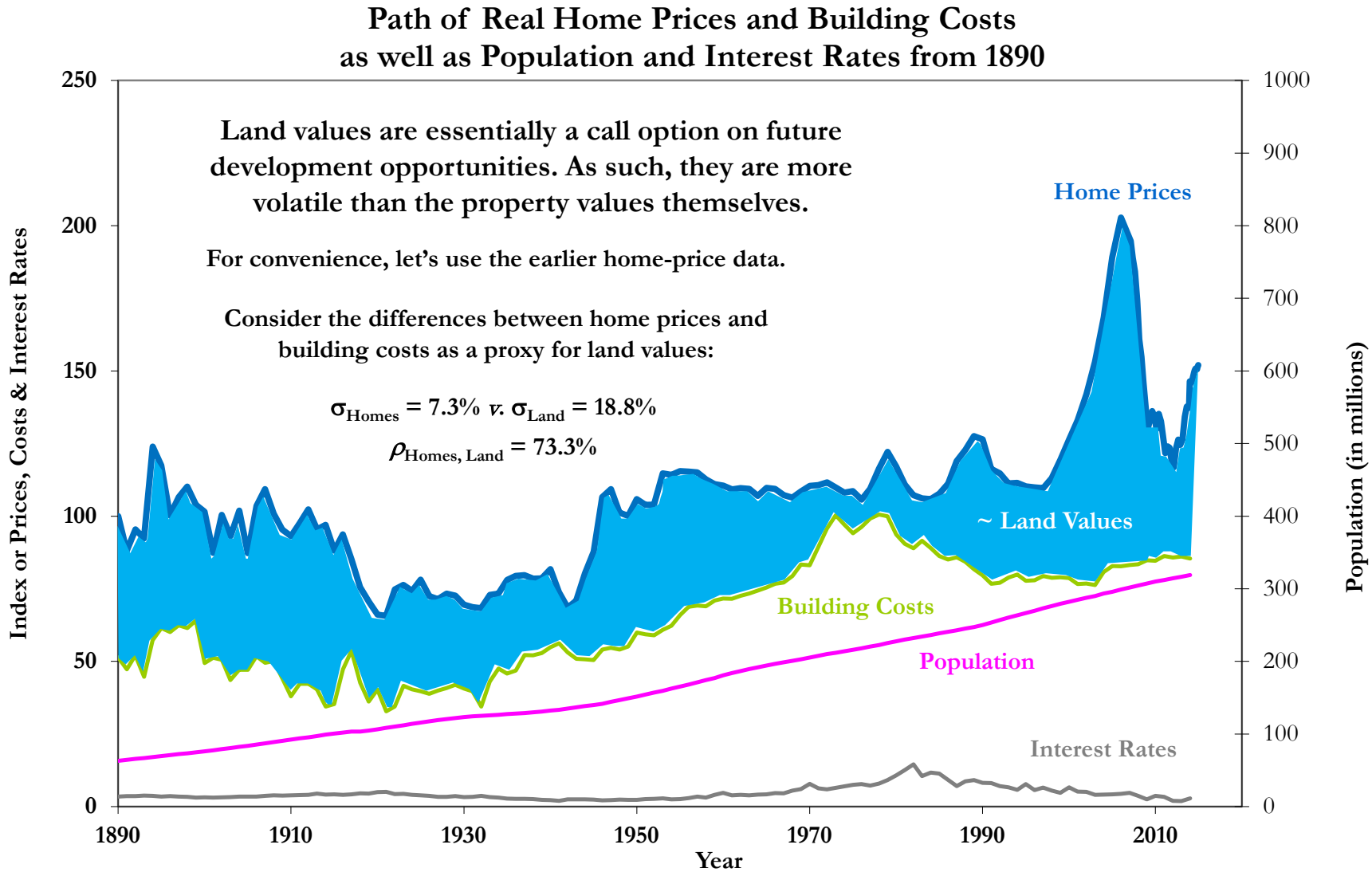
California Urban Real Estate	Inception	12/31/08 Net Assets ($Mil.)	2008 Return (%)
AGI-TMG Housing Partners 1	11/06	$1.5	-61.8
Bridge Urban Infill Land Development	6/02	29.9	-51.1
Buchanan Urban Investors 2	8/03	339.2	7.5
California Smart Growth Fund 4	7/06	28.7	-45.8
California Urban Investment Partners	2/97	411.3	7.5
CalSmart	3/01	285.2	-9.0
Canyon Johnson Urban Fund 3	10/08	-5.0	NM
Centerline Urban Capital 1	6/02	174.3	10.3
CIM California Urban Real Estate Fund	12/00	610.1	2.7
CityView America Fund	7/05	39.0	-88.5
CityView LA Land Fund 1	4/07	3.2	NM
KAREC California Development Program	4/02	179.6	-5.2
KSC Affordable Housing Investment Fund	7/02	31.8	-1.4
Legacy Partners Affordable Housing Fund	6/03	70.9	-0.8
Pacific Cityhome	8/03	176.6	-16.6
Housing			
Hearthstone Housing Partners 2	8/04	114.5	-46.0
Hearthstone Housing Partners 3	10/06	-5.4	NM
Hearthstone MS Value Added 3	9/03	-1.8	NM
Hearthstone Path-of-Growth Fund	11/05	55.0	-66.9
Institutional Housing Partners Investment Fund 1	7/92	104.7	106.6
Institutional Housing Partners Investment Fund 2	9/95	25.3	-30.0
Institutional Housing Partners Investment Fund 3	10/99	357.1	-15.6
Institutional Housing Partners Investment Fund 5	1/03	16.0	-67.6
M/W Housing Partners 3	1/01	-300.3	NM
Newland: Cal-Land Asset Partners	8/95	11.9	-46.8
Newland National Partners	10/99	191.6	-53.1
Newland National Partners 2	10/03	176.5	0.3
Newland National Partners 3	5/05	83.0	-85.9
Newland National Partners 4	6/05	26.9	-98.6
Resmark ORA Multifamily Investments 1	12/04	-5.6	NM
Resmark ORA Residential Investments 1	10/99	-5.5	-69.1
Shea Capital 1	4/05	53.6	NM
Shea Mountain House	5/05	149.0	NM
Wells Fargo Realty: WFHAI Housing Fund	8/92	154.0	-52.5
Wells Fargo Realty: Dison Urban Housing	12/00	-4.2	NM

NM: Not meaningful due to high negative returns or negative net assets.

Source: ***Real Estate Alert***, May 20, 2009.

CHICAGO BOOTH

Land Values Are the Most "Bubblicious" of All



Source: Robert Shiller | *Irrational Exuberance* and Instructor's calculations.

Replacement-Cost Fallacy =*f*(Land Value Volatility)

- There is an optionality value embedded in land values.
- The value of this option is extremely volatile.
- Consider the typical replacement cost analysis:

Property Value	<	Land Value + Replacement Cost of the Improvements

- Properties acquired (or developed) during the bubble (almost) always illustrate this inequality

This sort of analysis can contribute to inflating the bubble!

- If you disagree, how many deals lost in investment (or loan) committee because:

Property Value > Land Value + Replacement Cost of the Improvements

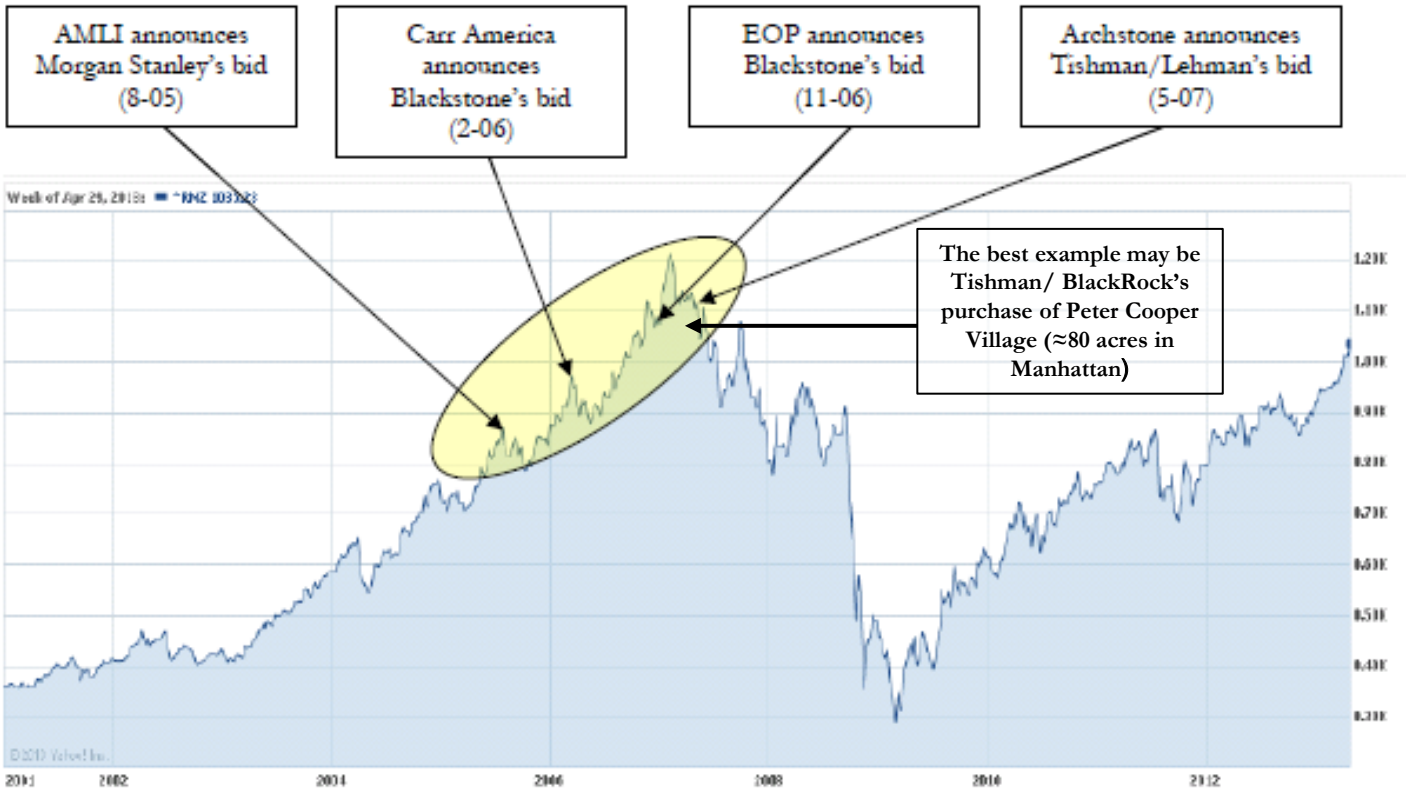
Replacement-Cost Fallacy→ Deals Done before the Crash

- But, when the bubble bursts, land values crash and the inequality is reversed!

Property Value > Land Value + Replacement Cost of the Improvements

In a crash, land values approach zero

- Consider the performance of various high-profile deals following the crash:



Source: Yahoo Finance and Instructor's annotations

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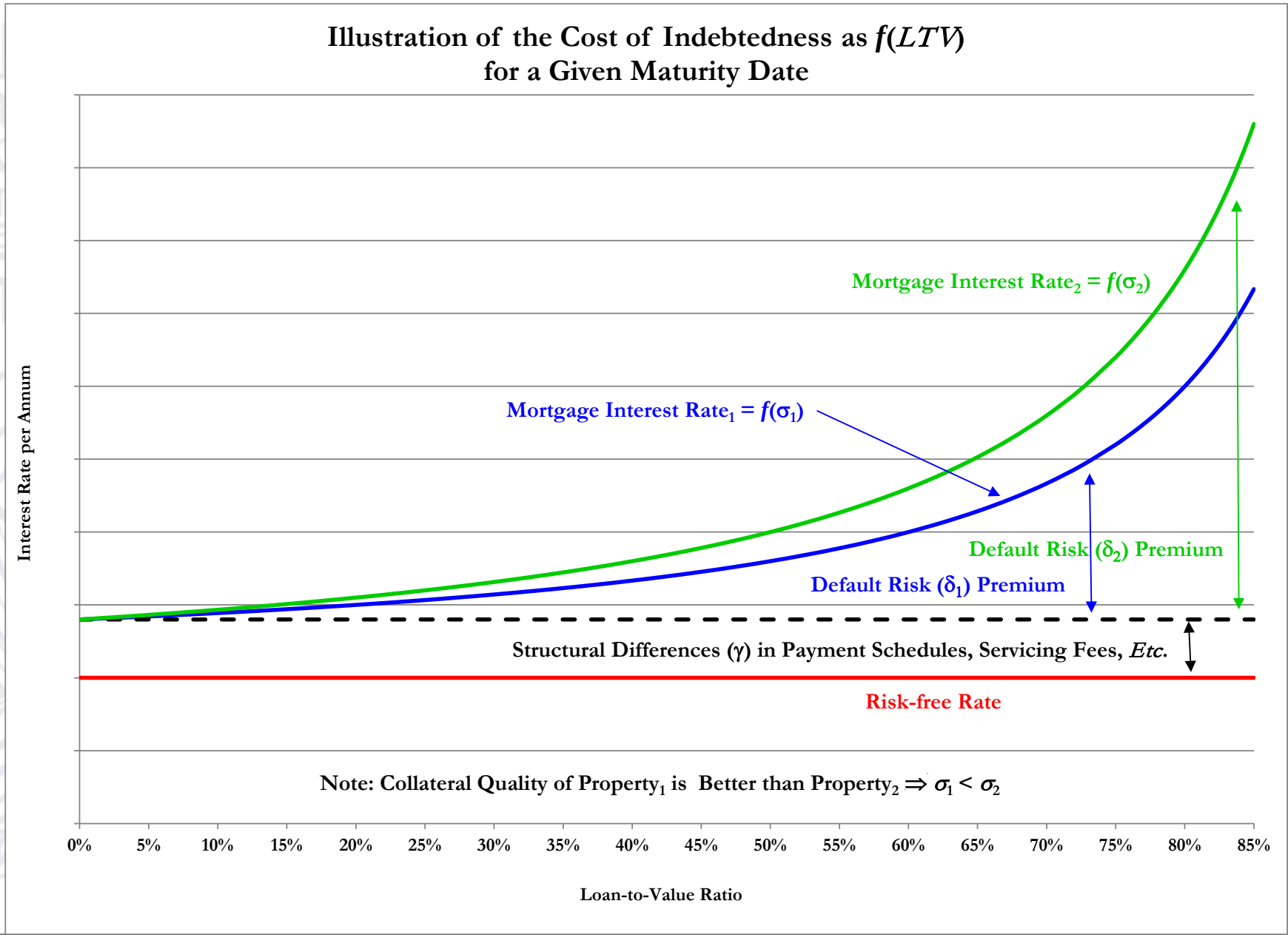
Lending Spreads as *f*(LTV) & Asset Quality

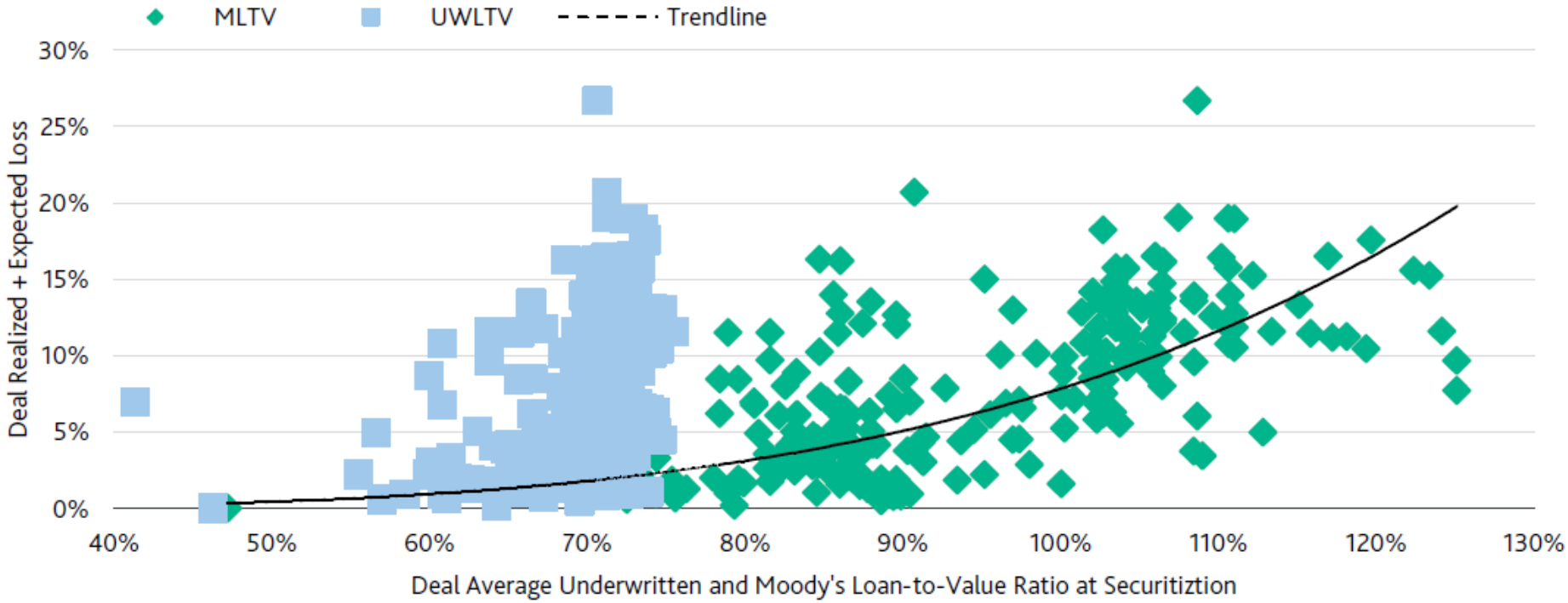


Another View of Lender's Required Risk Premia

- Moody's estimate of realized loss as $f(LTV)$:

EXHIBIT 2

Moody's and Underwritten LTV as Indicators of Credit Risk



Note: Each conduit/fusion transaction rated by Moody's between 2001 and 2008 is represented by a pair of dots, one for its average underwritten LTV at origination and one for its average Moody's LTV.

Source: Moody's Investors Service

Source: "U.S. CMBS Q2 Review," Moody's, July 2014.

Fundamental Relationship: Max $k_d \rightarrow E[k_a]$

- As the LTV $\rightarrow$ 100%, the $k_d \rightarrow E[k_a]$

  i.e., the maximum interest rate = the asset's expected return

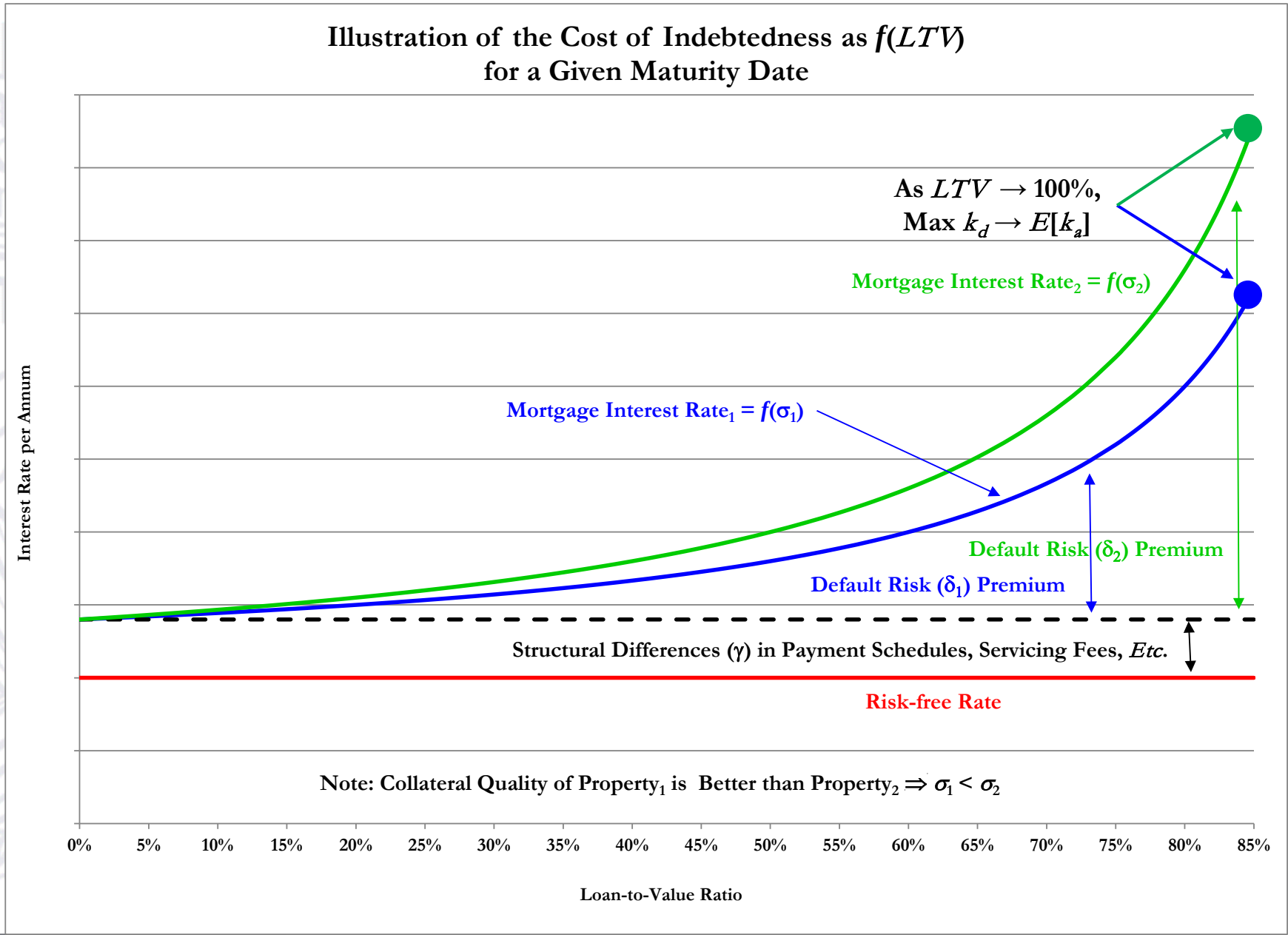
- Why?

  Cannot distribute more than the asset produces!

- This is nothing more than one of the M&M propositions:

  Debt & equity positions merely divide up different claims on the asset's return

Maximum Interest Rate → Asset's Expected Return



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  i.e., the maximum interest rate = the asset's expected return

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- This is nothing more than one of the M&M propositions:

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---

- So: How do lenders produce returns higher than $E[k_a]$?

  LEVERAGE

  This is true for both debt and equity positions!

Let's Look at an Example | Lender's Perspective

- Assume $E[k_a] = 8\%$
- $\therefore$ As the LTV $\rightarrow$ 100%, the $k_d \rightarrow E[k_a] = 8\%$
- How can lenders produce returns higher than $E[k_a]$?

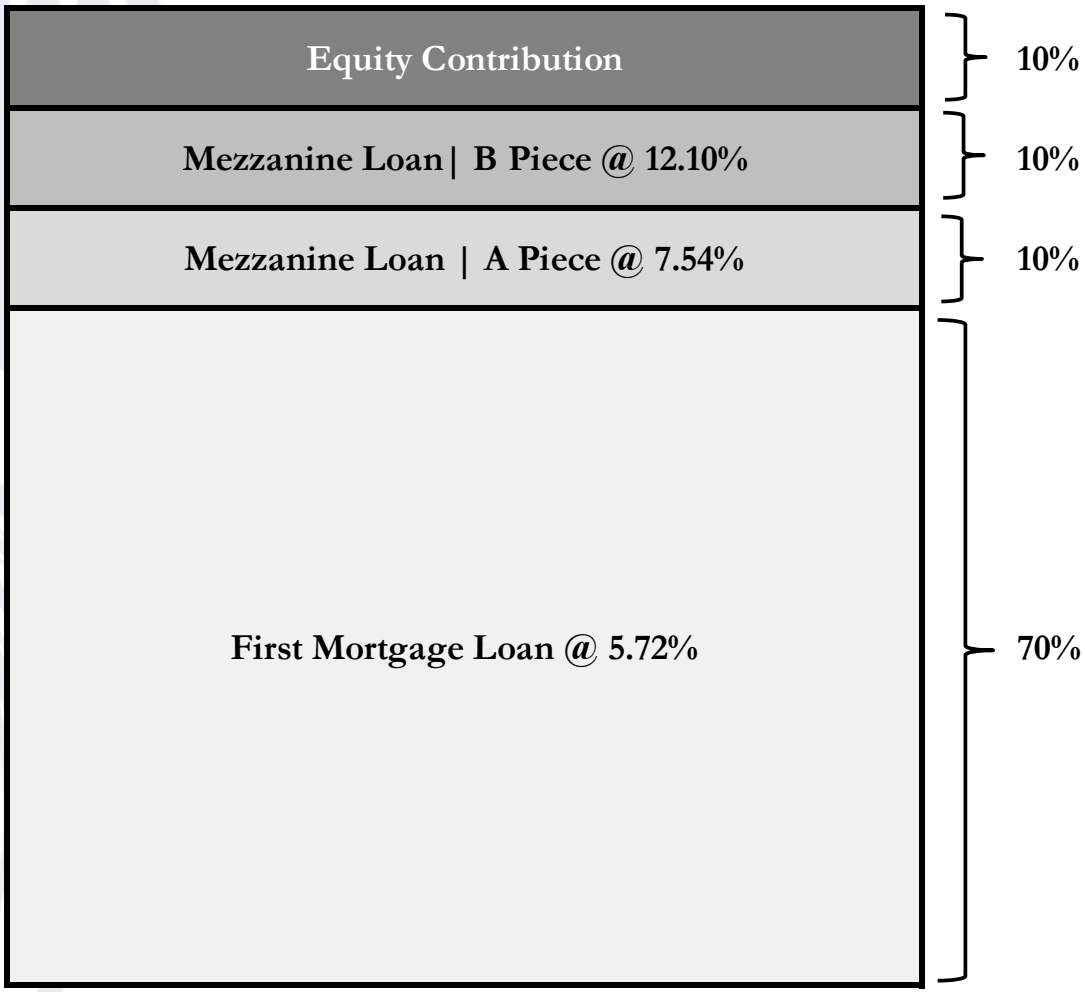
  Even though the debt cost (k_d) is less than $E[k_a]$
- As before, the answer is **LEVERAGE**
- In this case, consider subordinated junior tranches

  These positions effectively are "long" the entire loan, while being "short" the more-senior positions
- Consider the following example:

Let's Look at an Example | Simple "Cap Stack"

- Assume:
  - 70% first mortgage @ 5.72%
  - 20% "mezz" loan @ 9.82%
- Further assume that mezz is split into "A" & "B" pieces
  - Mezz A @ 7.54%
  - Mezz B @ 12.11%
- The weighted cost of debt capital (k_d) is 6.63%

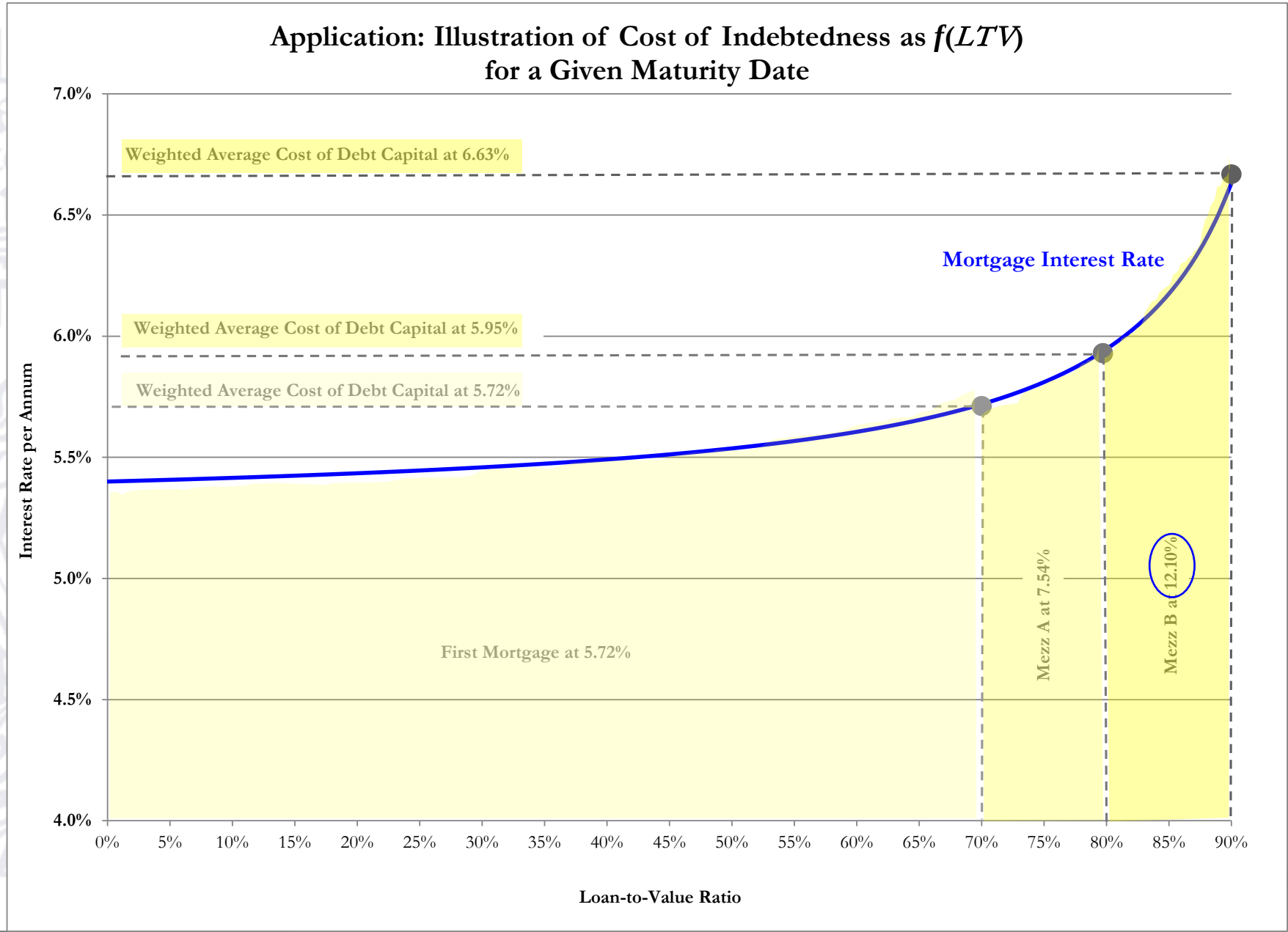
Another Look | Simple "Cap Stack"



Weighted Average Cost of Debt Capital:

k_d = 70/90 @ 5.72% + 10/90 @ 7.54% + 10/90 @ 12.11% = 6.63%

Yet Another Look | Simple "Cap Stack"



For Opp Funds, "Distressed" Debt is the Rage

- Much of the opportunistic fund-raising in the debt space has been for various types of "distress" – consider:

February 1, 2013 Commercial Mortgage ALERT 4

Colony Preps 3rd Distressed-Debt Fund

Colony Capital is laying the groundwork for its next distressed credit fund, less than a year after closing its last one.

The Santa Monica, Calif., operator has begun talking to investors about Colony Distressed Credit Fund 3, aiming to raise $750 million to $1 billion of equity. The operator would buy subperforming or defaulted senior mortgages and mezzanine debt, and could also originate transitional loans for distressed property owners. The vehicle targets a 15% return.

Colony last year had a final close with $1.4 billion of equity for the predecessor fund and co-investment vehicles. Over the past few years, through that fund and other vehicles, Colony was the biggest buyer of commercial real estate assets from the **FDIC.** While massive FDIC loan offerings have tapered off, the agency, banks and other sellers continue to hawk distressed-debt portfolios. The fund also can invest some 30% of its capital in Europe, where there remains an overhang of distressed bank debt that may be sold in the next 12-24 months.

With leverage, Colony could double the vehicle's buying power to $2 billion. The manager, which doesn't use a placement agent, is expected to market the fund to investors globally. Much of the money in the previous fund came from Asia and Europe.

Colony was among the original fund shops to play in distressed debt. Founded in 1991 by financier **Tom Barrack,** it made a fortune from the S&L liquidations of the early 1990s and then moved into the lucrative European and Asian markets before refocusing over the past two years on distressed debt in the U.S.

The shop also manages a mortgage REIT, Colony Financial, as well as a series of property funds and vehicles that buy foreclosed single-family homes and convert them to rentals. ❖

Reminder:

Tom Barrack, Colony's founder and chairman, provided the keynote address at the 2012 Booth Real Estate Conference

Notes:

Actual close at $1.2 billion, with $400 million oversubscribed. Another $600 million was raised through co-investment (or "sidecar") vehicles.

Source: PERE News, October 13, 2014.

Hedge funds are also active in this space

Blackstone Mortgage Trust (BXMT) is a milder version of this sort of activity.

For Opp Funds, "Distressed" Debt is the Rage (continued)

- As with Colony, these funds often quote mid-teen returns.
- How do they produce such returns?

  LEVERAGE

- Let's continue with our earlier example *w.r.t.* the B piece; assume it's 50% levered (as in the Colony fund):

Expected Return on Levered Loans
Using Mezz Loan B as Illustration

Balance Sheet	Capitalization	Return (or Cost)
Asset = Mezz Loan B	$2,000	12.11%
Debt	1,000	9.82%
Equity	$1,000	14.40%

Notes:

1) This result is equivalent to having bifurcated the B piece into 2 securities:

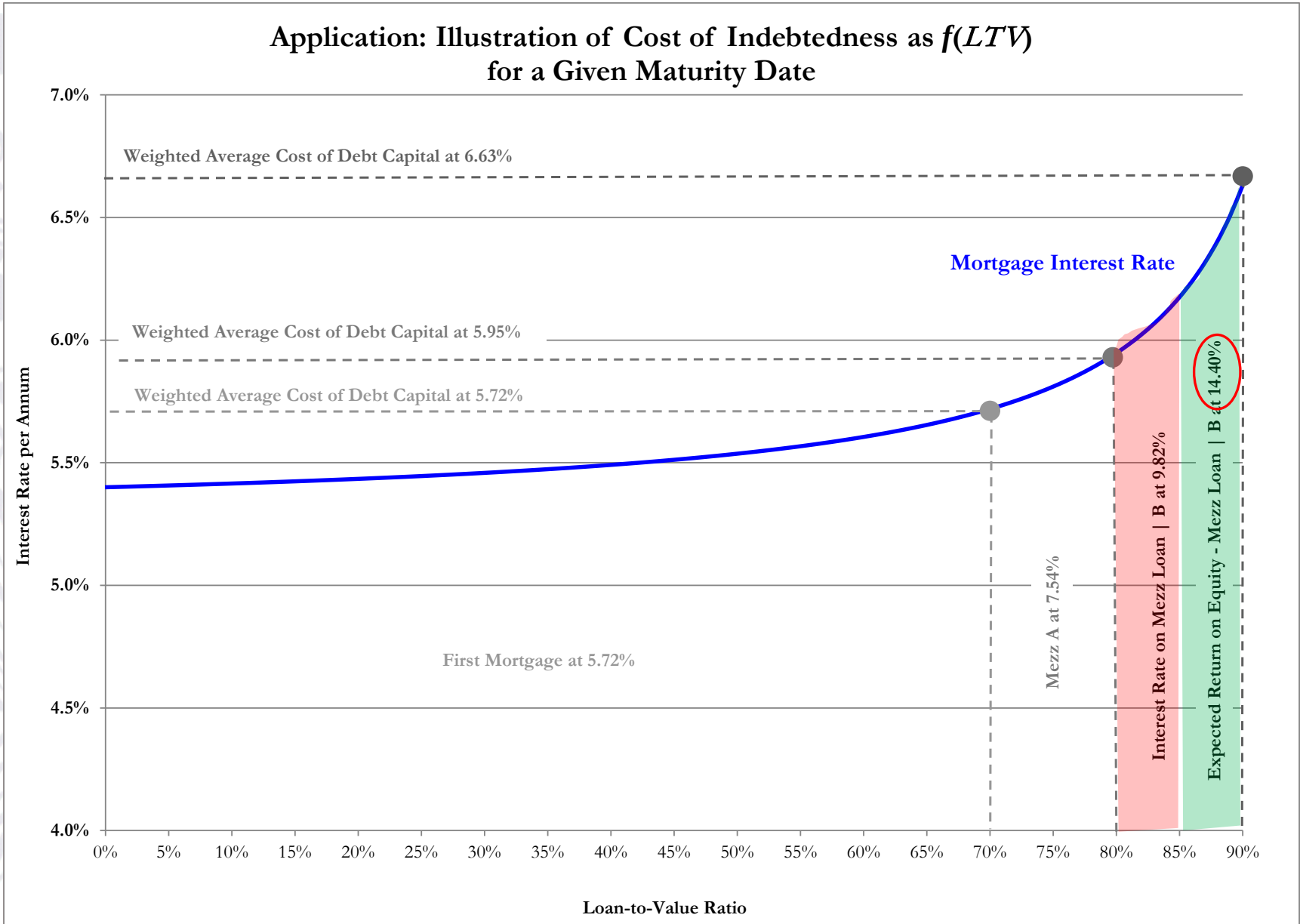
   •tranches B1 and B2

2) This result occurs without any "distress"!

3) Because of non-linearities (*e.g.*, max(k) = 14.4%), $E\{k\} < 14.4\%$

- Or, consider the following illustration of the same result:

For Opp Funds, "Distressed" Debt is the Rage (continued)



Levered Loans: A Few Additional Thoughts

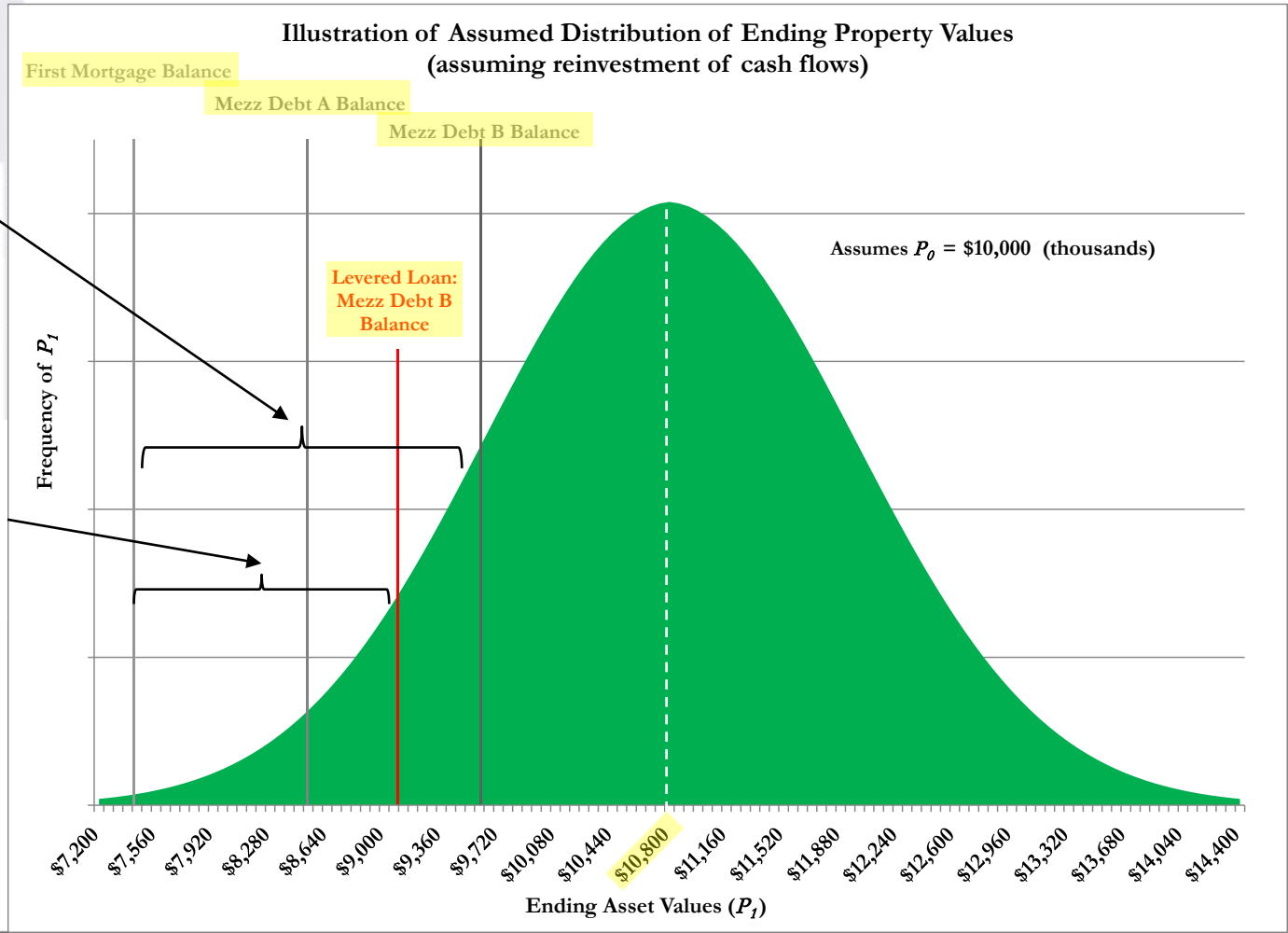
- **These levered loans are risky** | Assume the asset's volatility (σ_a) = 12%:
  - Then, the Prob(return = -1.0) ≈ 7%
  - Then, the Prob(return < 0.0) ≈ 14%
  - Thus, the Prob(return = .144) ≈ 86%

$\therefore \quad E\{k\} < 8\% \; \{ = f(\sigma)\}$

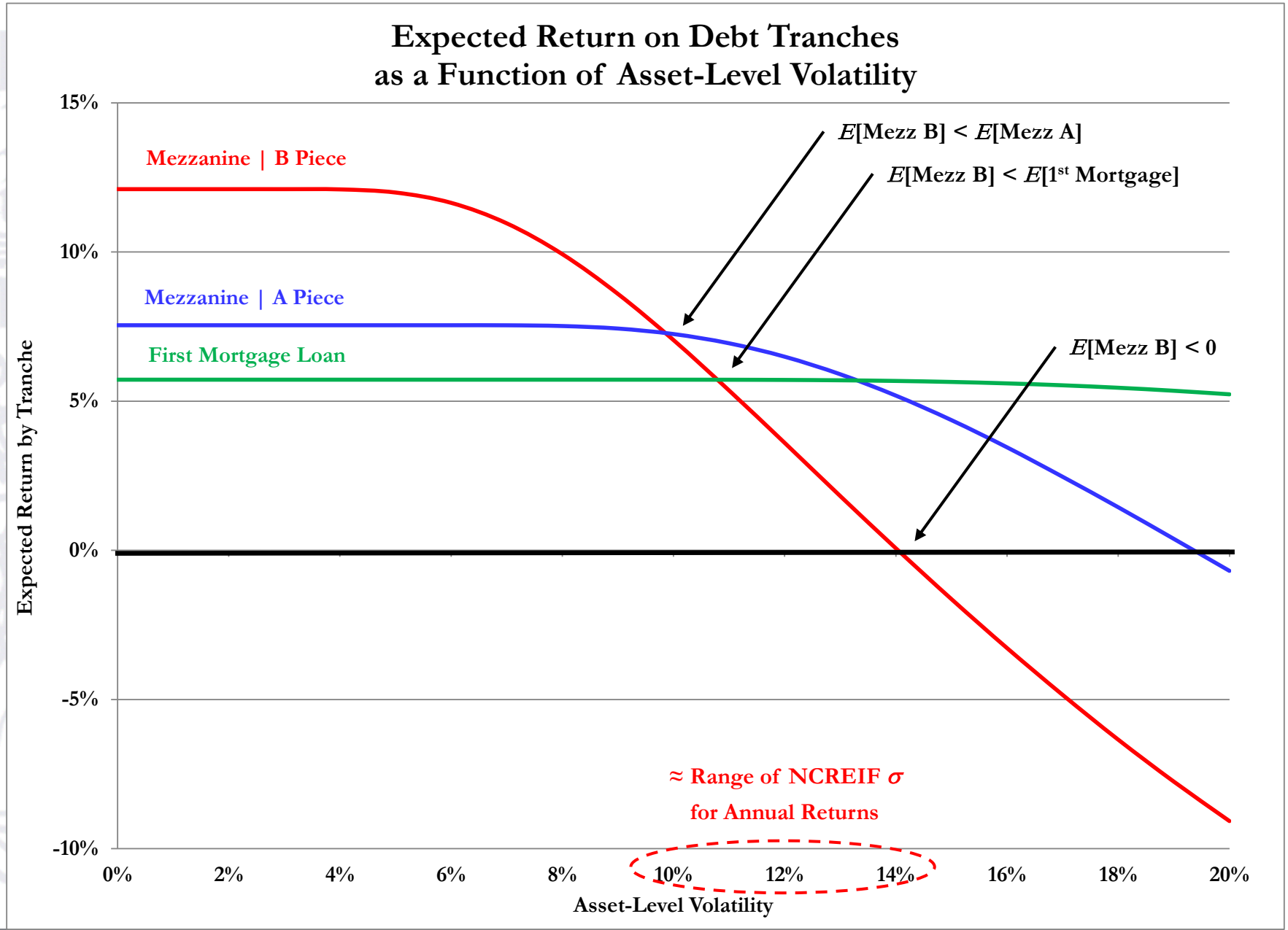
[even worse after promoted interest]

•If property value is insufficient to repay the First Mortgage, Mezz | A Piece, levered loan on Mezz | B Piece & return levered Mezz B's equity, then levered Mezz B investors earn less 0%

•If property value is insufficient to repay the First Mortgage, Mezz | A Piece & levered loan on Mezz | B Piece, then levered Mezz B investors lose all their equity



Expected Return on Risky as $f(\sigma)$



Some Thoughts on Winners & Losers: Agenda

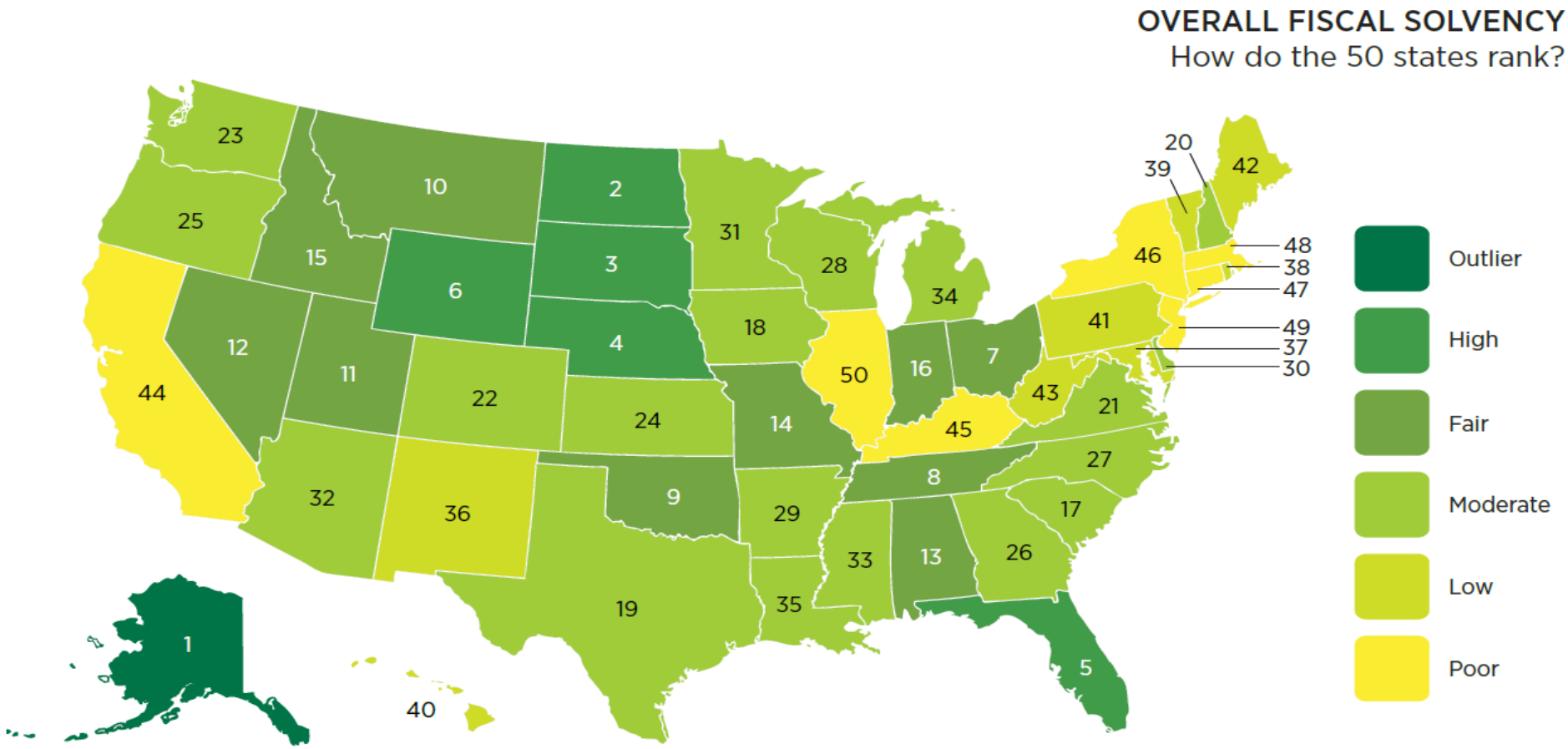
- **Winning Arguments:**
  - The components of return
  - JVs as principal/agent problems
  - The drag of transaction costs
  - Core *v.* non-core performance

- **Losing Arguments (at least for now):**
  - Cap rates *v.* interest rates
  - Impact of leverage → the law of one price
  - The volatility of land values → discount to replacement cost
  - Mezz debt & levered loans
  - State & local finances ← a mispriced risk

- **My Next Argument:**
  - Urban multifamily: NIMBY *v.* YIMBY

The Financial Strain on State & Local Budgets

- It is no surprise that many state & local budgets are under enormous financial strain. Consider:



MERCATUS CENTER
George Mason University

Source: Eileen Norcross, "Ranking the States by Fiscal Condition" (Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, July 2015).

Note: All data are for FY 2013.

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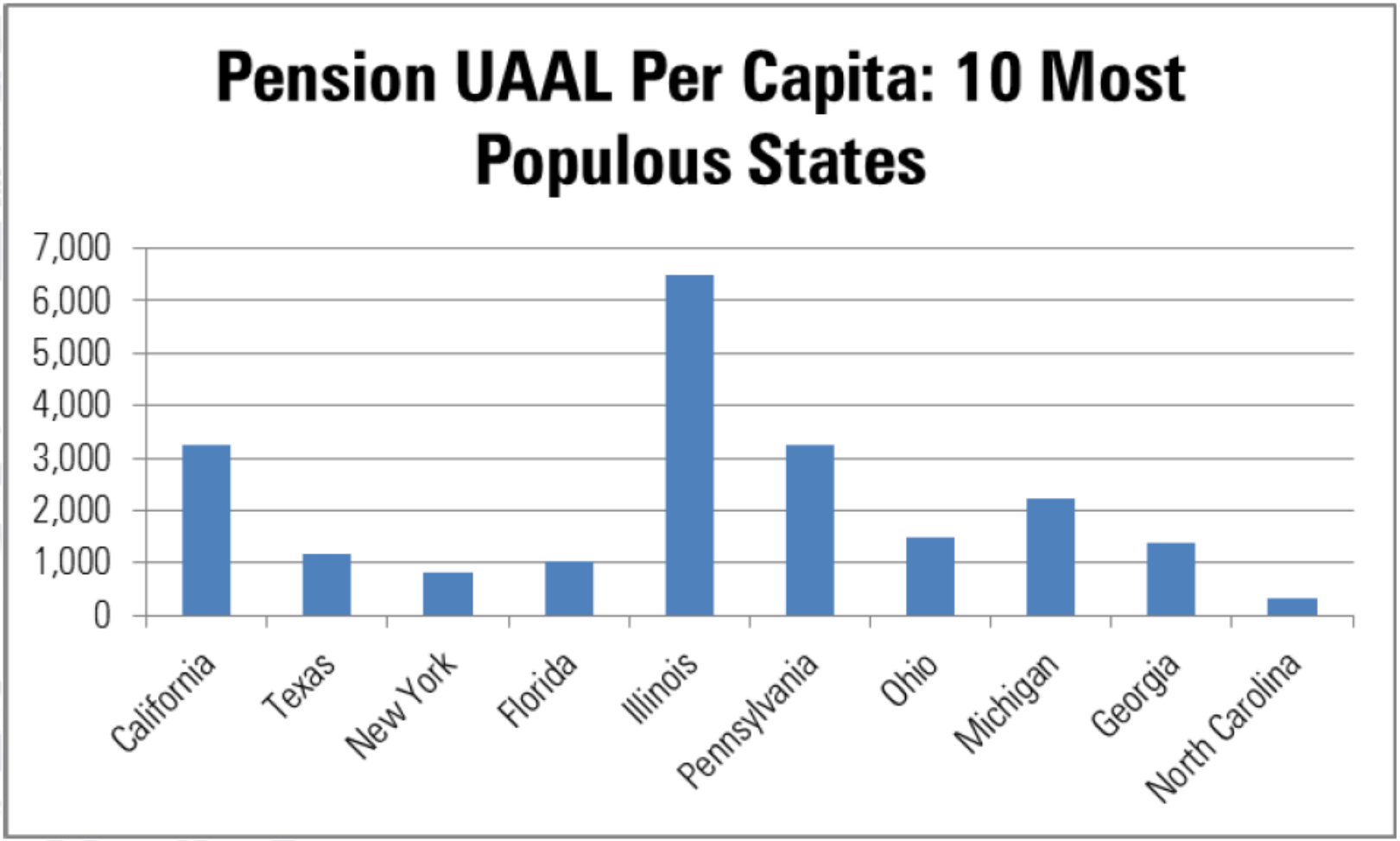
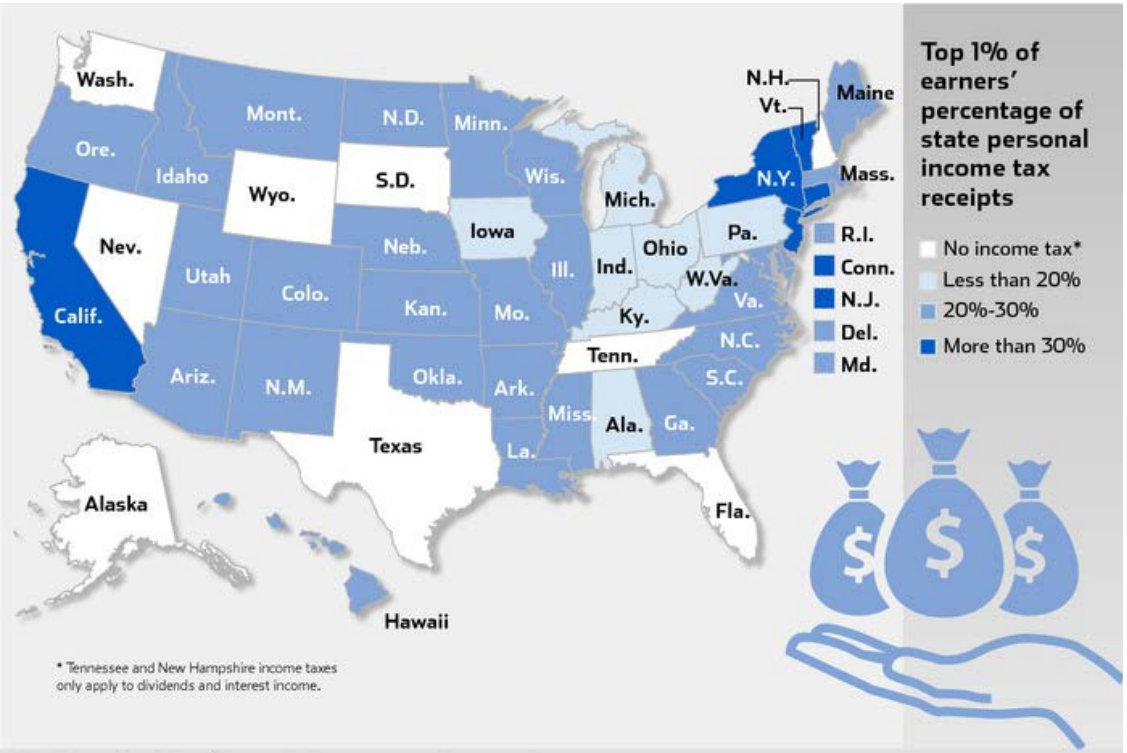
The Financial Strain = *f*(Unfunded Pension Liabilities)

- It is also no surprise that many state & local budgets are under enormous financial strain due to unfunded pension liabilities. Consider:



Source: Rachel Barkley, "State and Local Pensions 101," Morningstar, October 19, 2012.

Increasing Realization: Taxing the Rich Doesn't Work



Taxing the Top | How high-earners fare in selected states

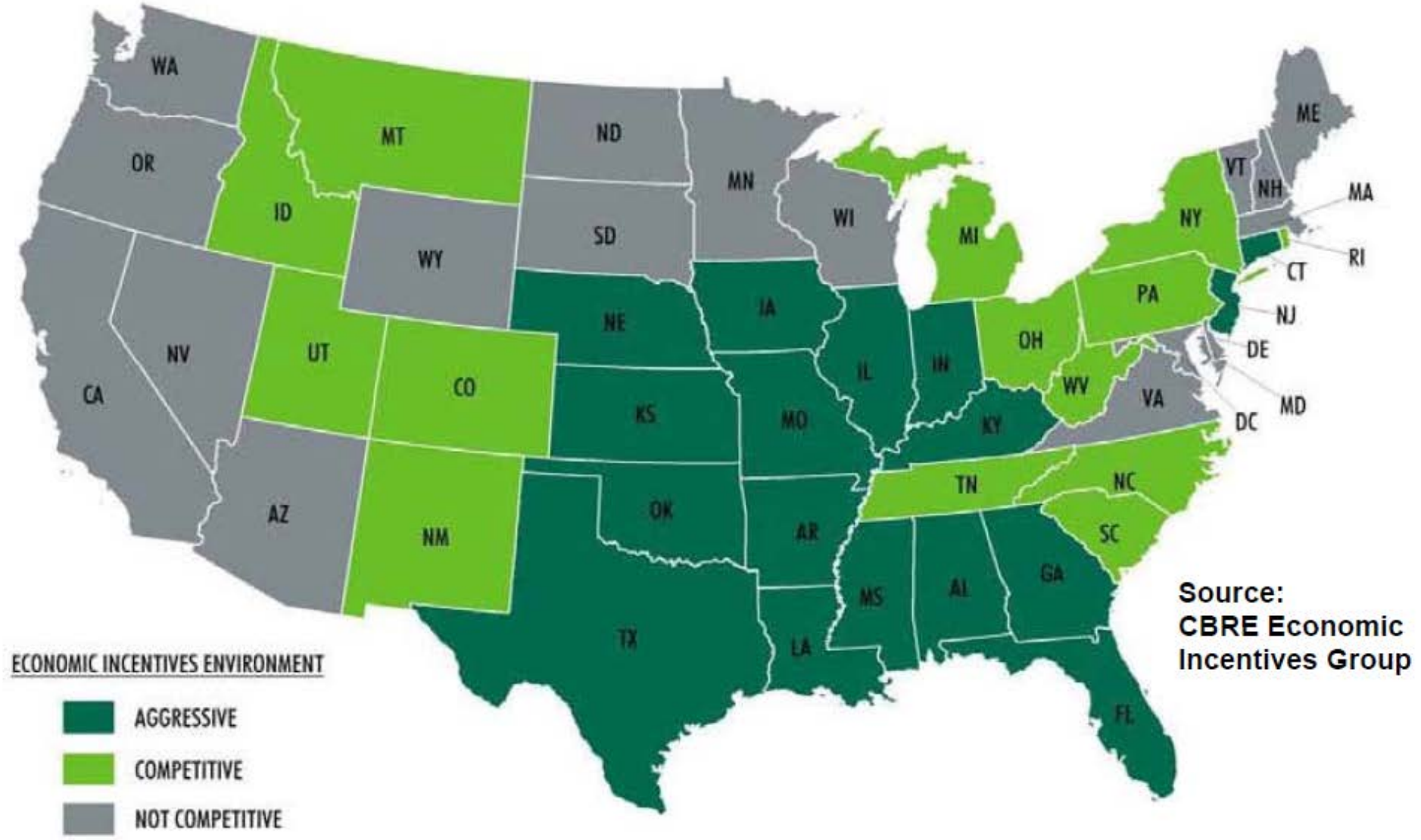
STATE	PERCENTAGE OF STATE REVENUE MADE UP BY INCOME TAXES	HIGHEST INCOME TAX RATE	INCOME LEVEL WHERE IT KICKS IN	PERCENTAGE OF INCOME TAX RECEIPTS PAID BY TOP 1%
California	43.9%	10.3%	$1 million	45%
Connecticut	49.3	6.5	500,001	40
Hawaii	28.4	11.0	200,001	20
Illinois	31.4	5.0	All income	25
Maryland	42.8	5.5	500,001	25
New Jersey	39.2	8.97	500,000	41
New York	56.7	8.97	500,001	41
Vermont	21.3	8.95	373,651	34

Sources: Institute on Taxation and Economic Policy; Federation of Tax Administrators; Tax Policy Center, Urban Institute and Brookings Institution

- At the state & local levels, "tax the rich" policies are increasingly problematic:
  - The income of the rich is more variable than lower brackets
  - The rich move to other states (*e.g.*, Florida and Texas) with lower income taxes
- Calls for "broadening the (income) tax base" will be met with political resistance.
- In order to cope, state & local authorities considering a range of service cuts &/or increasing other forms of taxation (*e.g.*, property and transfer taxes)
  - Both the cuts and the tax increases adversely affect <u>commercial</u> real estate values

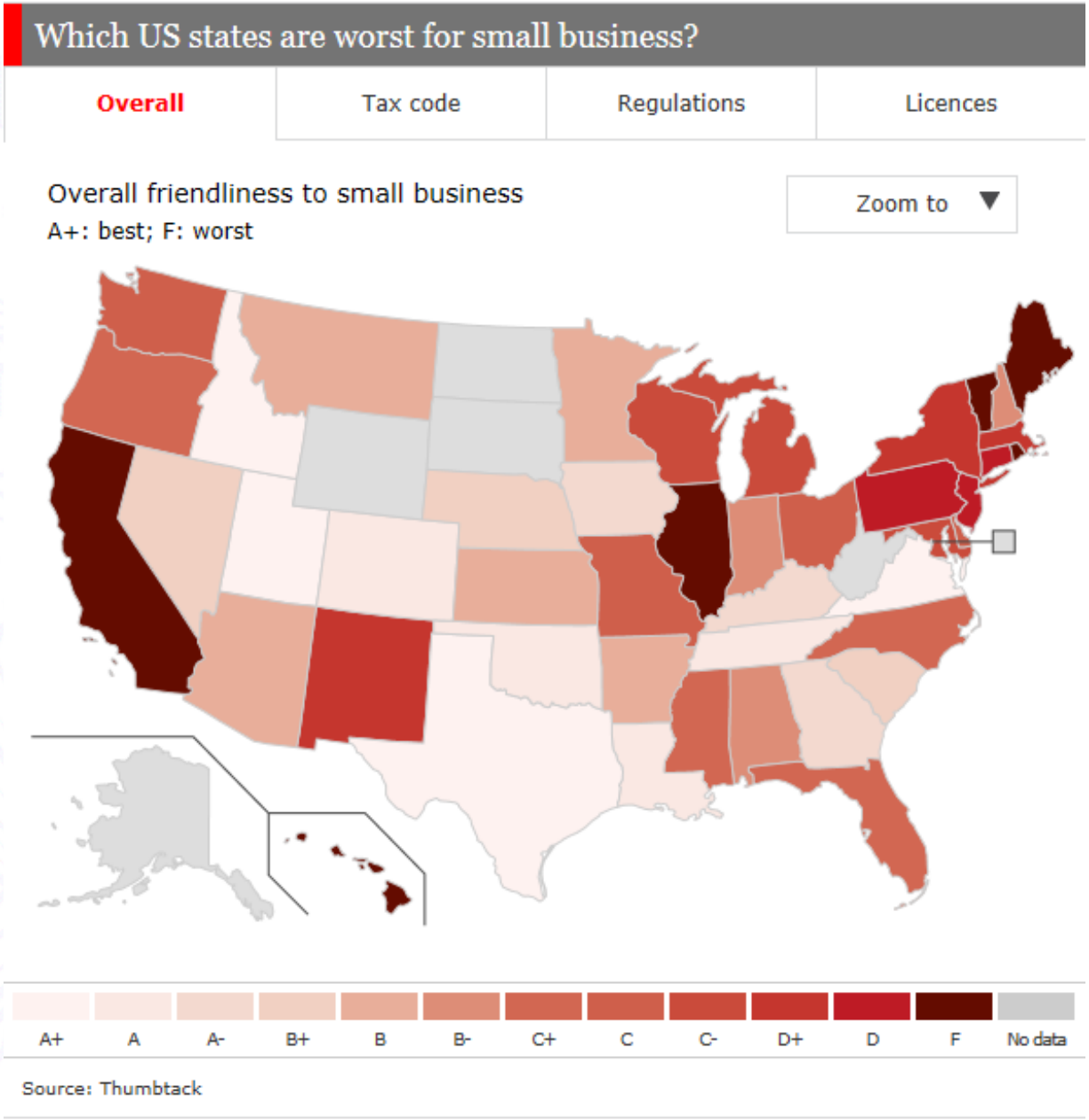
- Source: Robert Frank, "The Price of Taxing the Rich," *The Wall Street Journal,* March 26, 2011

Will Aggressiveness Change with State Fortunes?



- Source: Jim Costello and Mark Seely, "Industrial, Economic & Workforce Trends," CBRE Client Conference, October 28, 2010.

It Seems Regulatory Burden Associated with Finances



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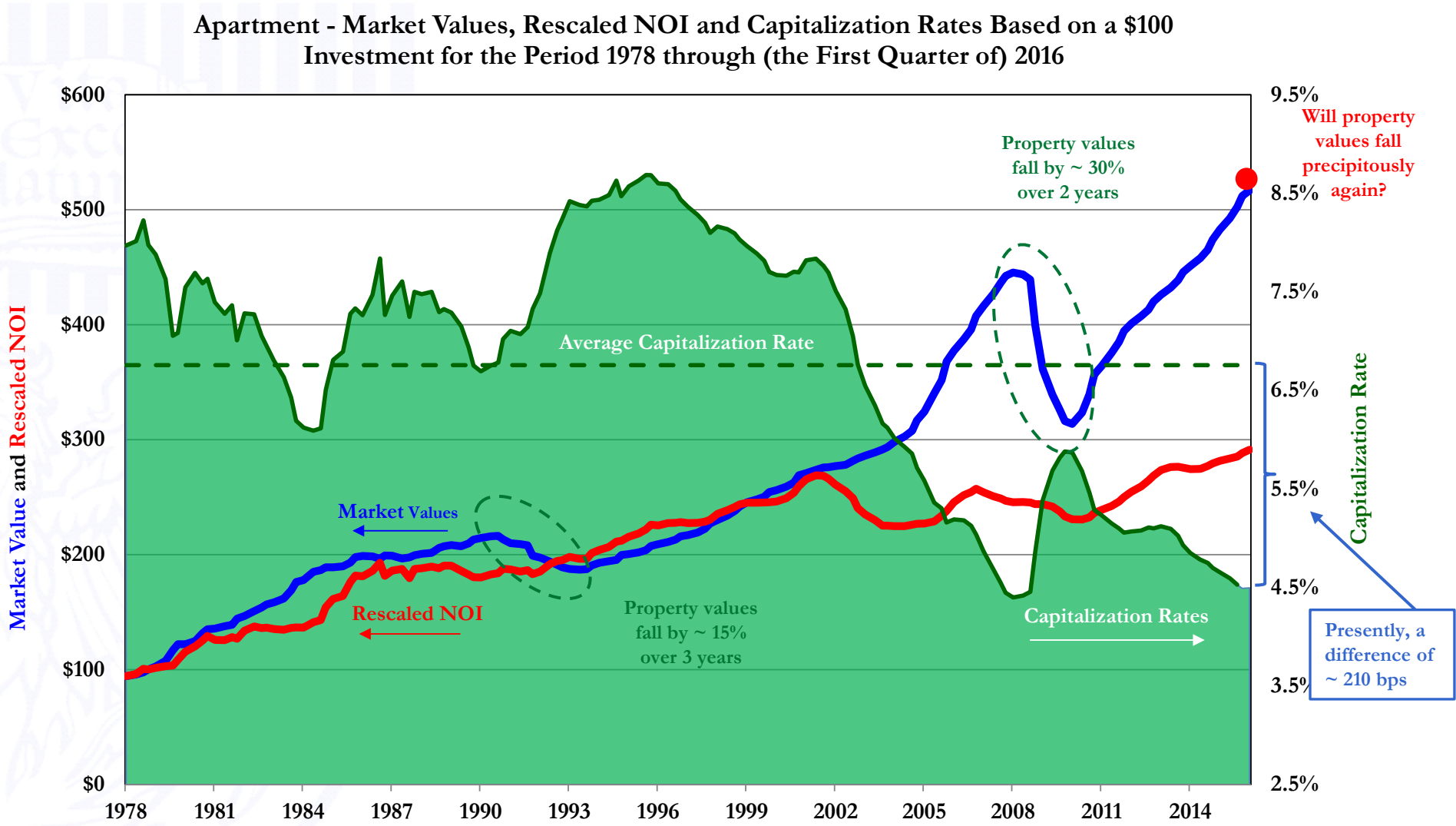
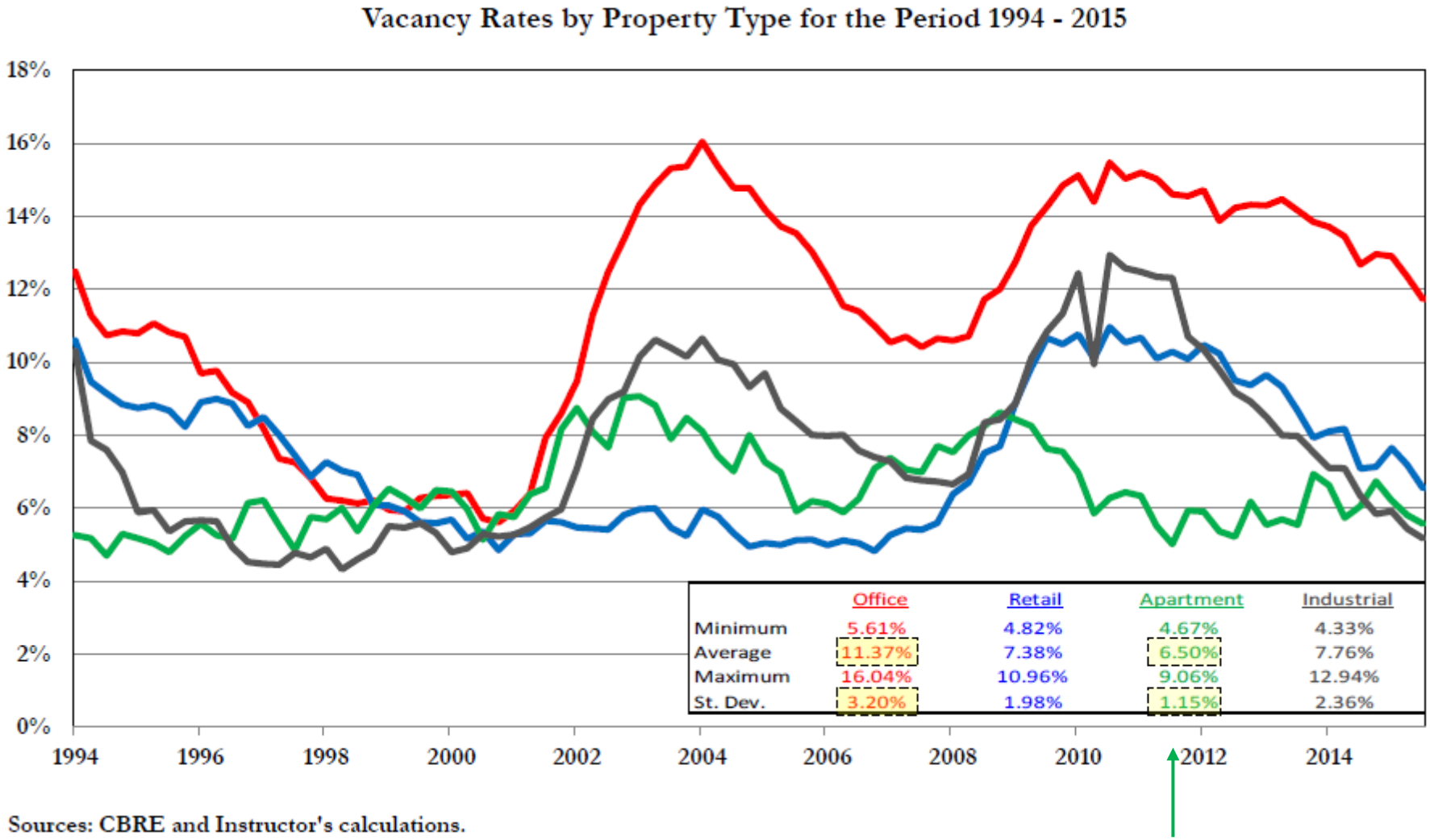
What About Multifamily Prices?



Vacancies | Apartments Have Lowest Average



Sources: CBRE and Instructor's calculations.

In addition to having the lowest average vacancy rate, the apartment sector did so with the least volatility

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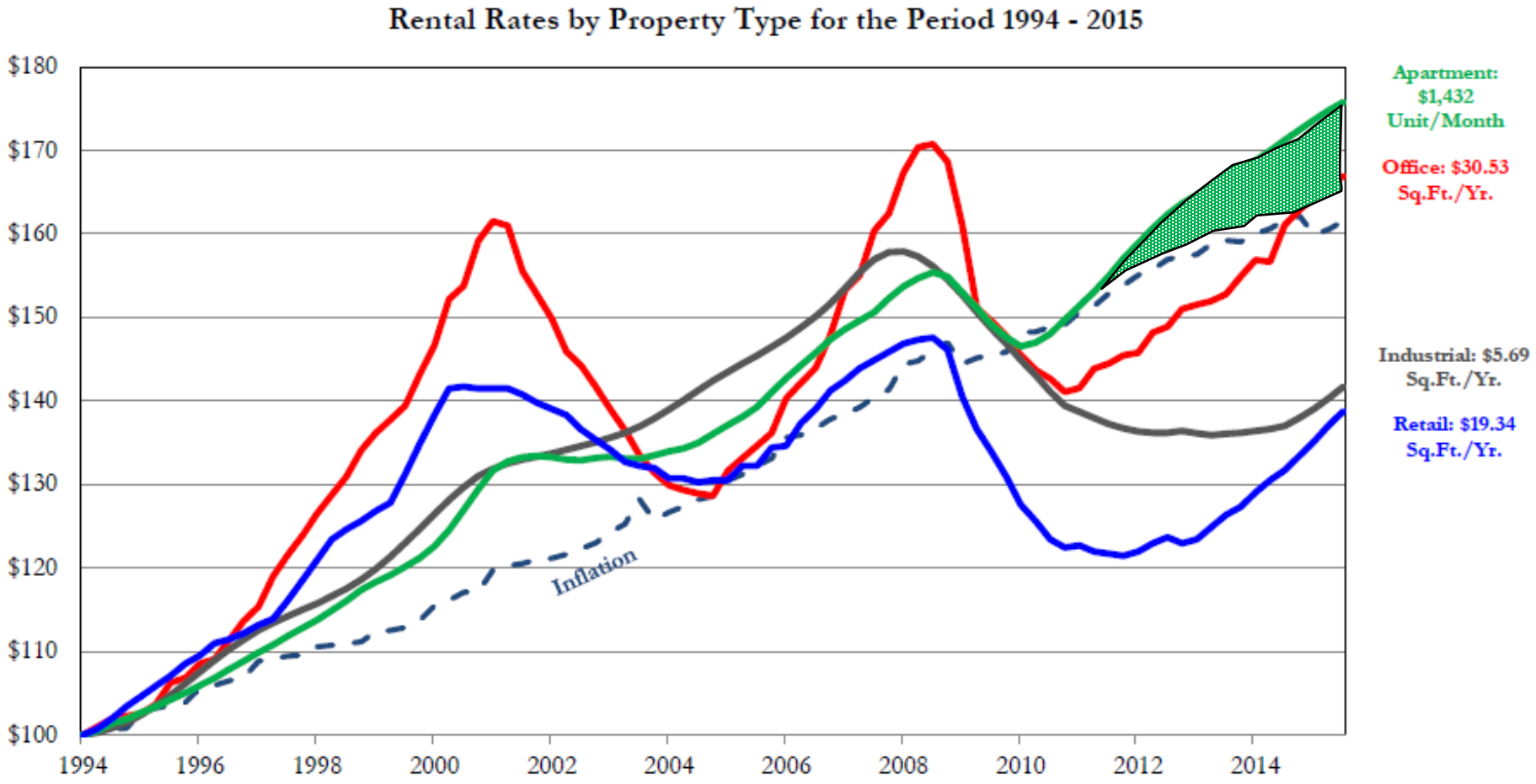
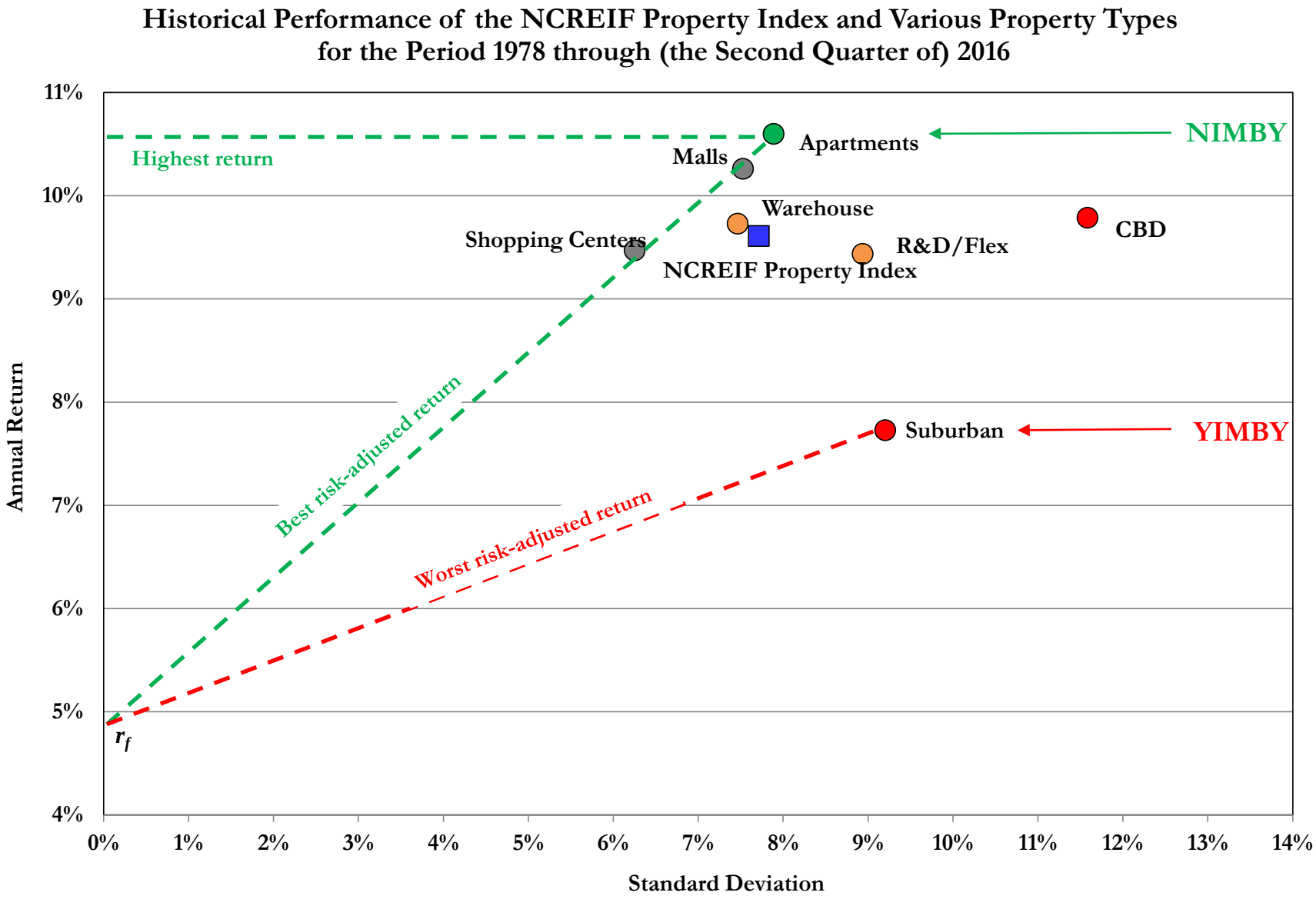
The Growth in Rents | Only Apts Beat Inflation



Sources: CBRE and Instructor's calculations.

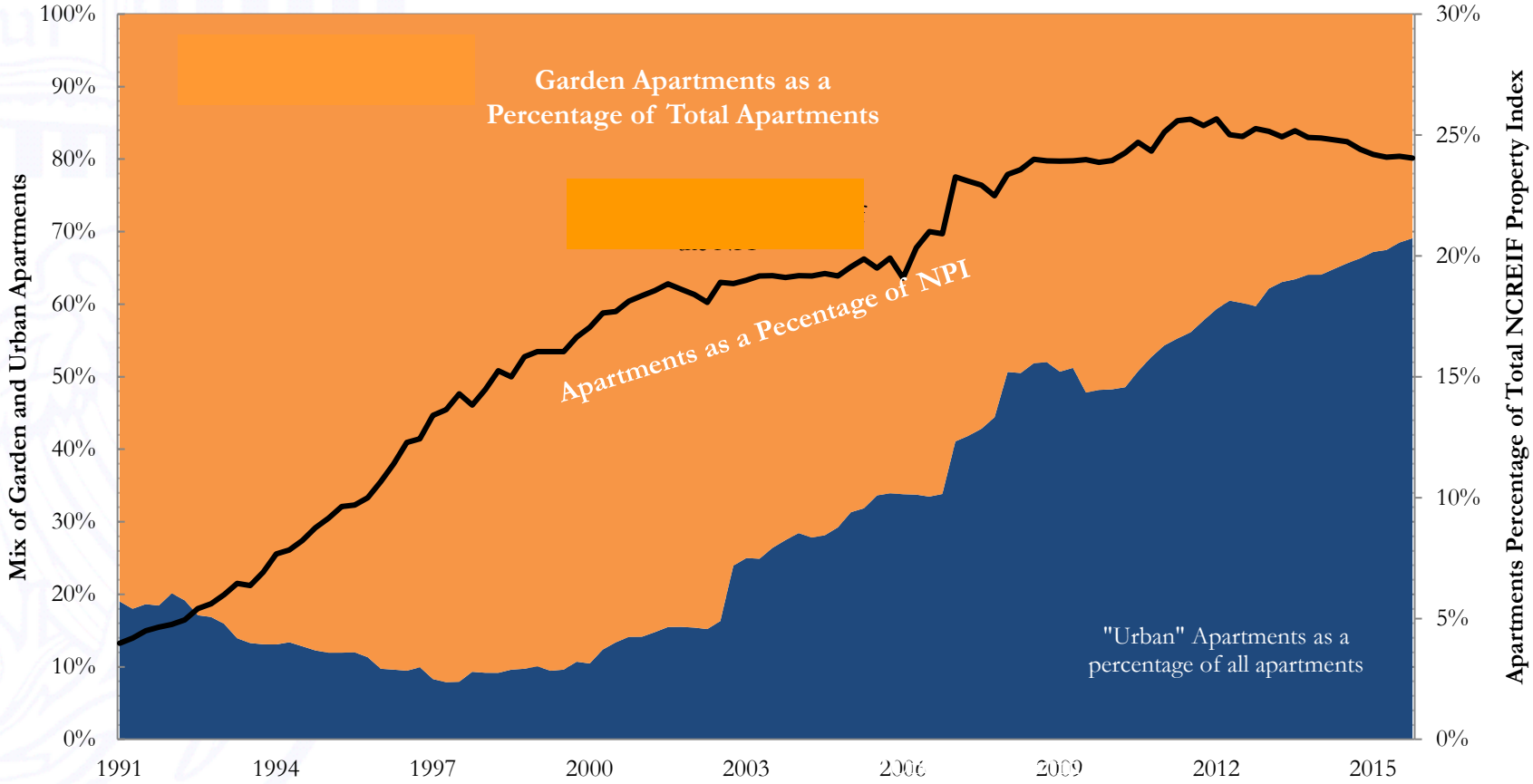
Apartments = Winner | Before & After Risk



•Changing NCREIF Apartment Composition

- The NCREIF apartment index, increasingly moving away from "Garden."
- Garden ← NIMBY *v.* Urban/High-Rise ← YIMBY:

NCREIF Apartment Allocations, for the Period 1991-2015



In earlier years, garden apartments was dominate

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•Consider the Anecdotal Buzz

- Wherever you look, it seems the headlines are all pretty much the same.
- An aside: Which city is pictured here? Does it matter?

THE WALL STREET JOURNAL.

HIGH-RISE APARTMENT BUILDINGS SPROUT IN DOWNTOWNS NATIONWIDE

'Manhattanization' of America Driven by Young Professionals, Empty Nesters

By Conor Dougherty
April 25, 2014 7:57 p.m. ET

Concluding Thoughts

- As an academic, you often need a "thick skin"
- It helps to remember the old adage:
  - "Occasionally mistaken, but never in doubt!"
  - CHEERS!!

Survey Questions

- For each of the following, please rate your level of agreement with the good doctor:

Completely Disagree	Somewhat Disagree	Unsure/ Neutral	Somewhat Agree	Completely Agree
[*1*]	[*2*]	[*3*]	[*4*]	[*5*]

- Winning Arguments:
  - A. The components of return: __
  - B. JVs as principal/agent problems: __
  - C. The drag of transaction costs: __
  - D. Core *v.* non-core performance: __
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