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The University of Chicago Booth School of Business

Some Thoughts on Leverage, Fees & Net Returns

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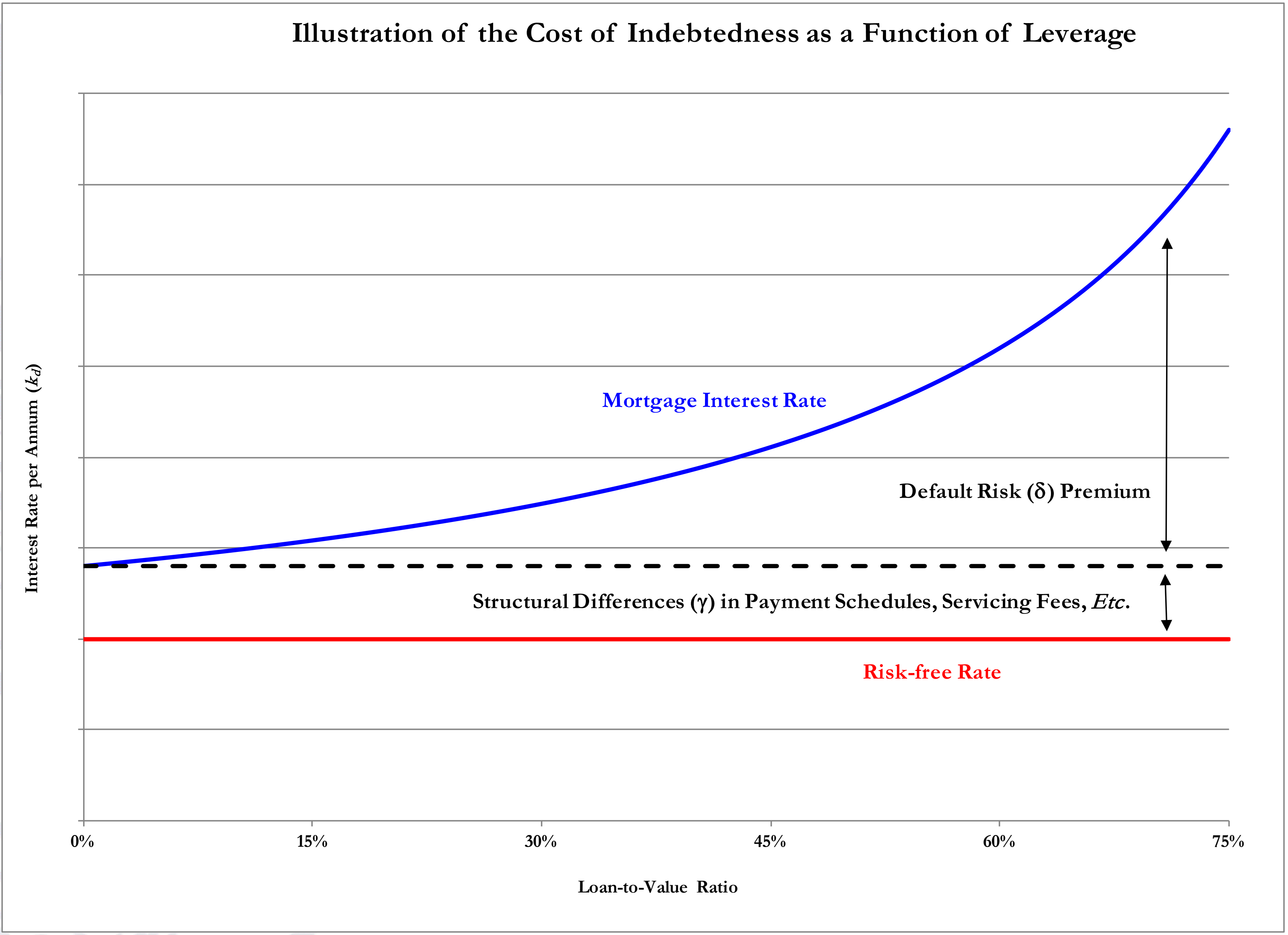
Some Thoughts on Leverage, Fees & Returns

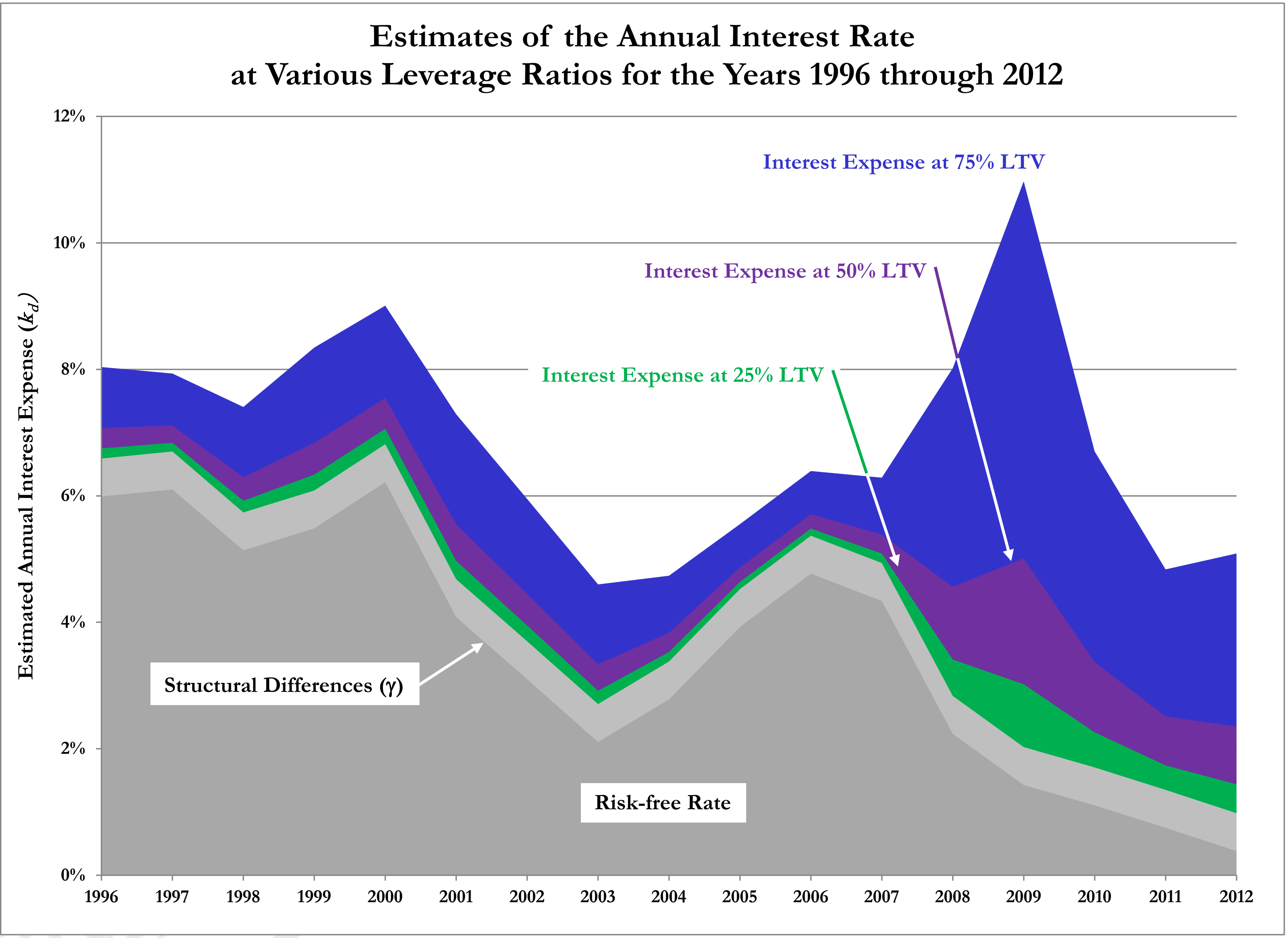
- Lending Spreads
- Levered Loans
- Levered Equity ← The Law of One Price
- Base Fees & Costs =*f*(Time)
- Promoted Interests: GPs *v.* LPs

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



Relationship is for a given moment in time

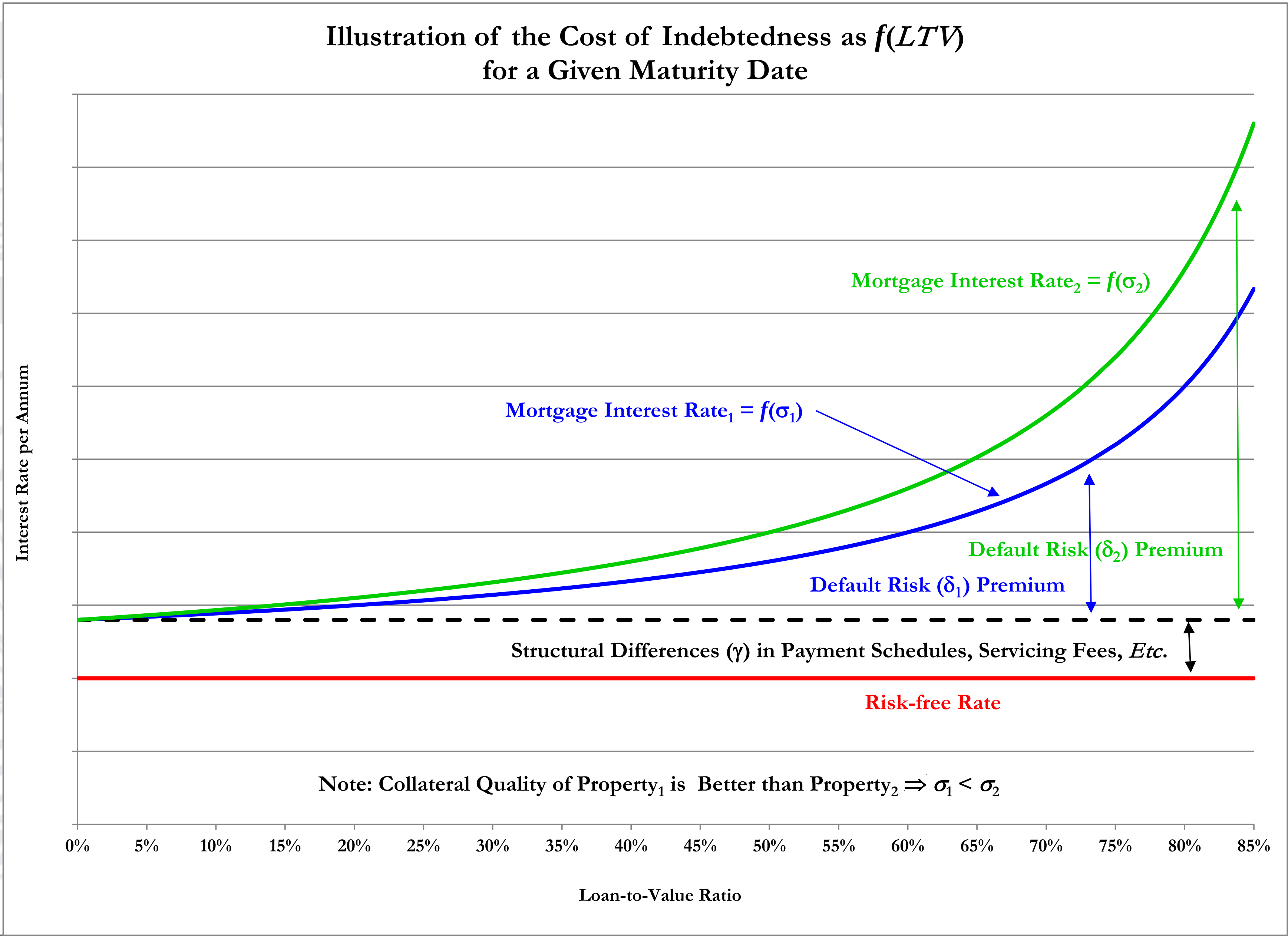
Risk-Free Rates & Spreads Vary Over Time



Changes Over Time:

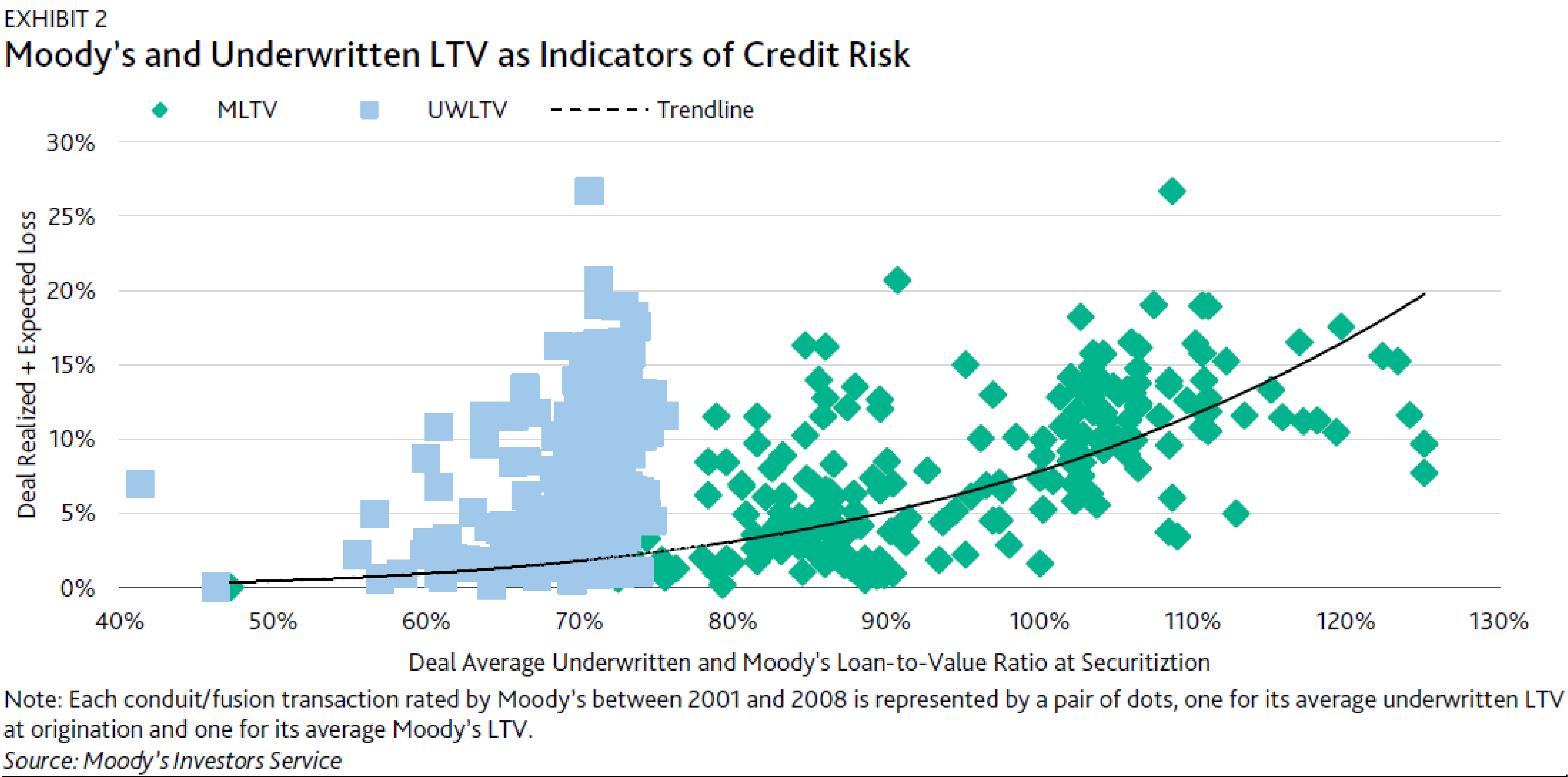
1. Risk-free Rate, and
2. Spreads:
   a) low before the financial crisis,
   b) spiked up during and after the financial crisis, and
   c) have started to recede thereafter

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



Another View of Lender's Required Risk Premia

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



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

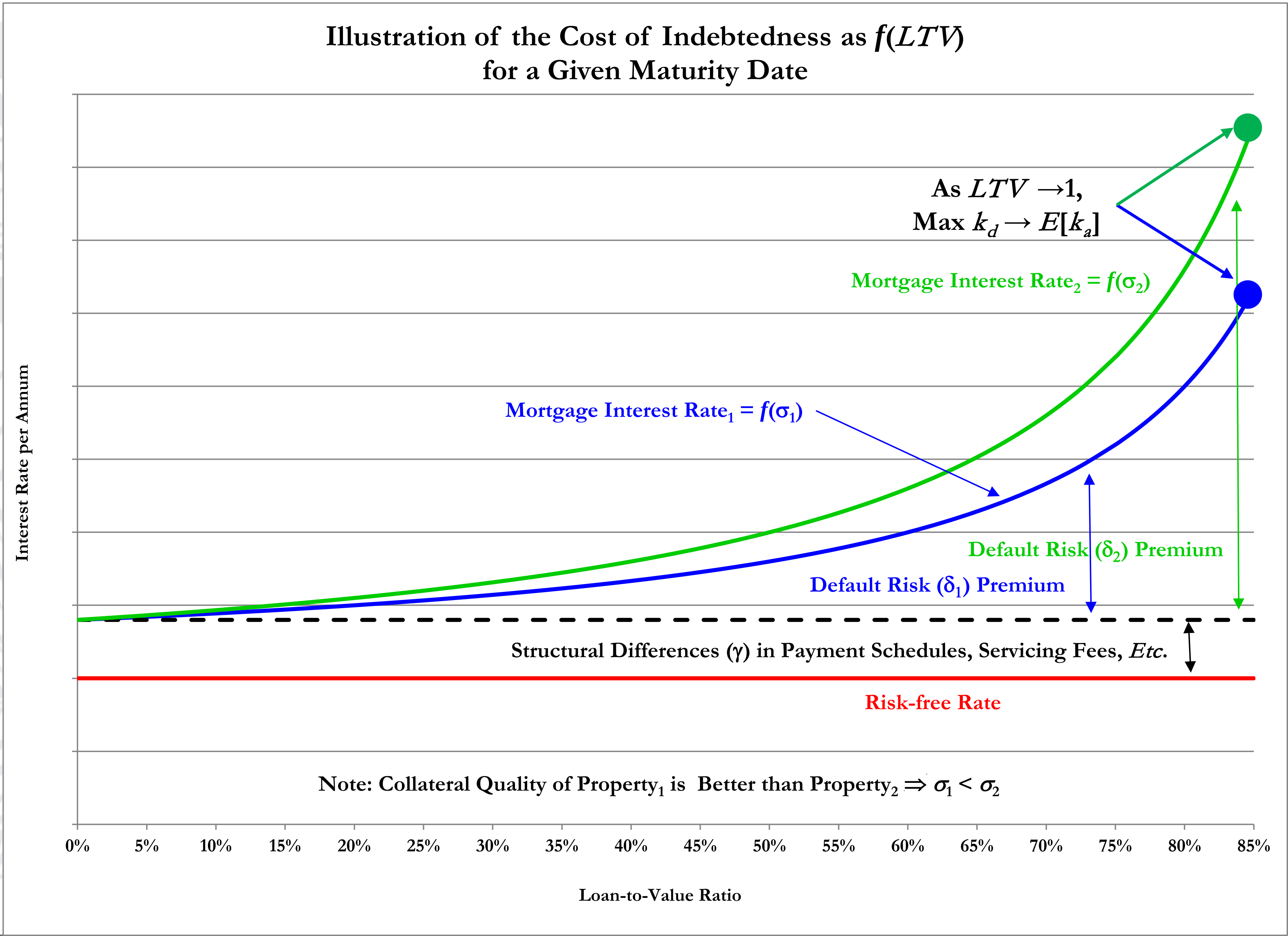
Fundamental Relationship: Max $k_d \rightarrow E[k_a]$

- As the LTV → 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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  Debt & equity positions merely divide up different (different) claims on the asset's return

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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"

LTV Ratio		
100%	Equity Contribution	10%
90%	Mezzanine Loan | B Piece @ 12.10%	10%
80%	Mezzanine Loan | A Piece @ 7.54%	10%
70%	First Mortgage Loan @ 5.72%	70%

Weighted Average Cost of Debt Capital:

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

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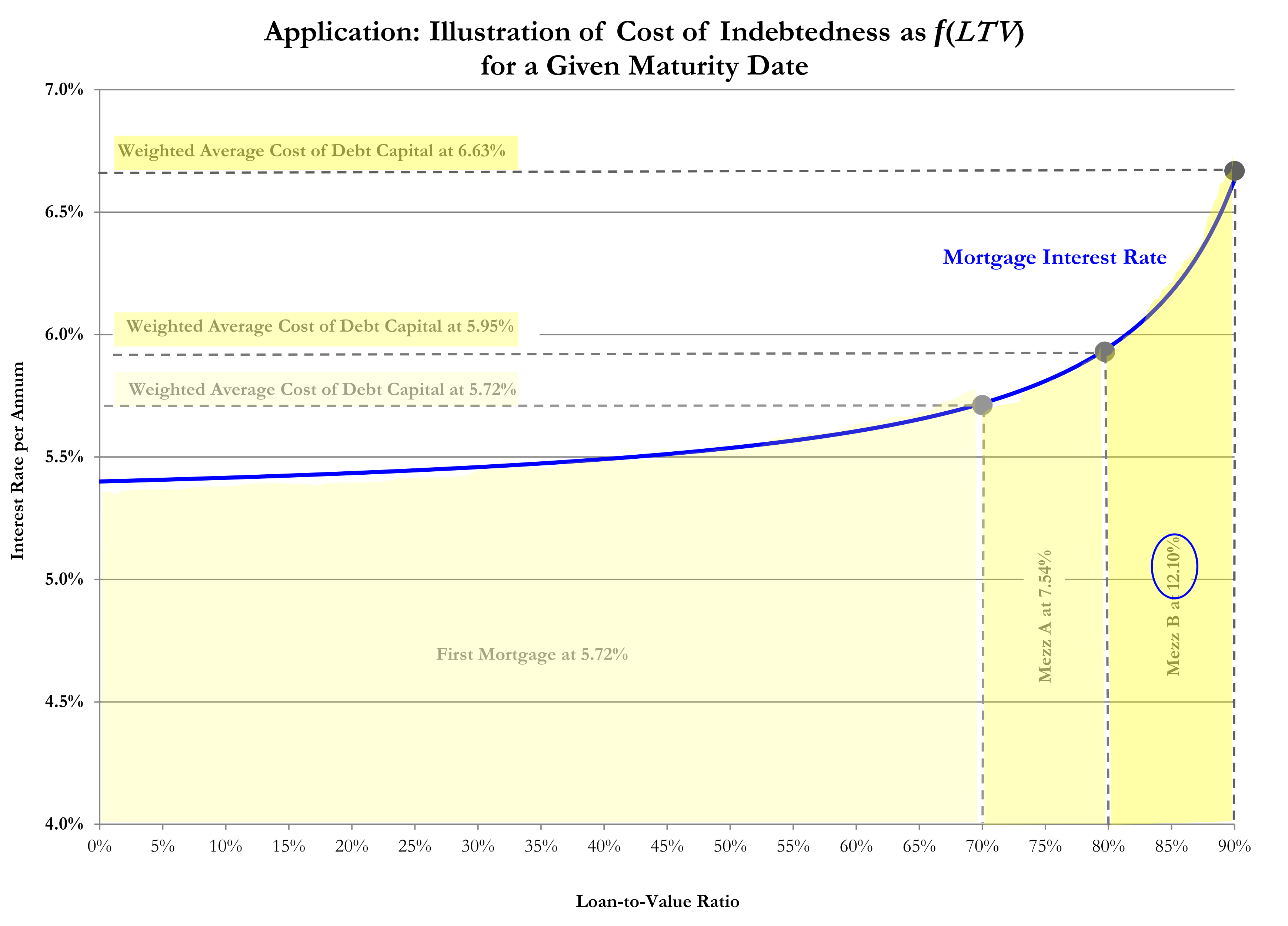
Yet Another Look | Simple "Cap Stack"



Some Thoughts on Leverage, Fees & Returns

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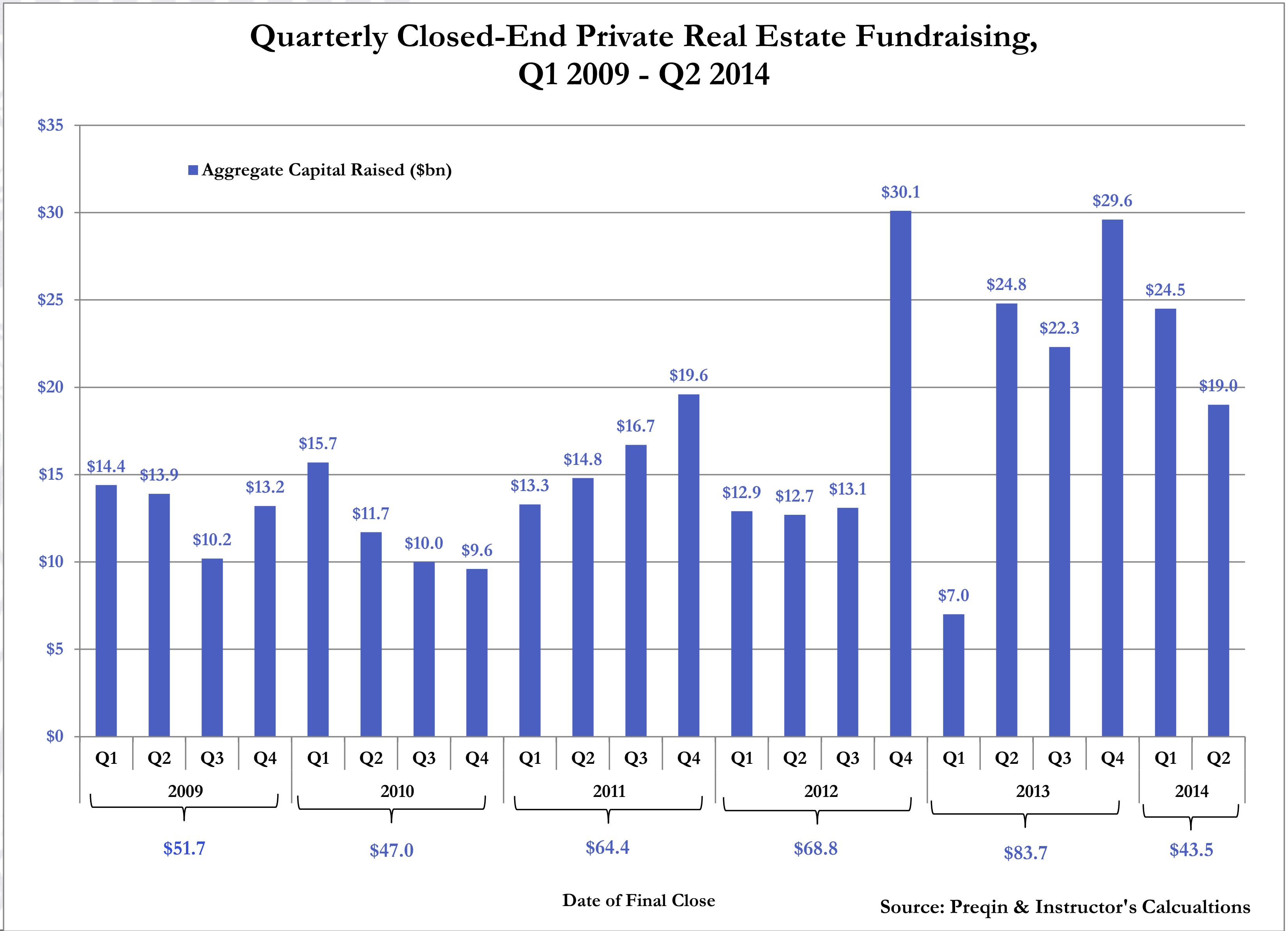
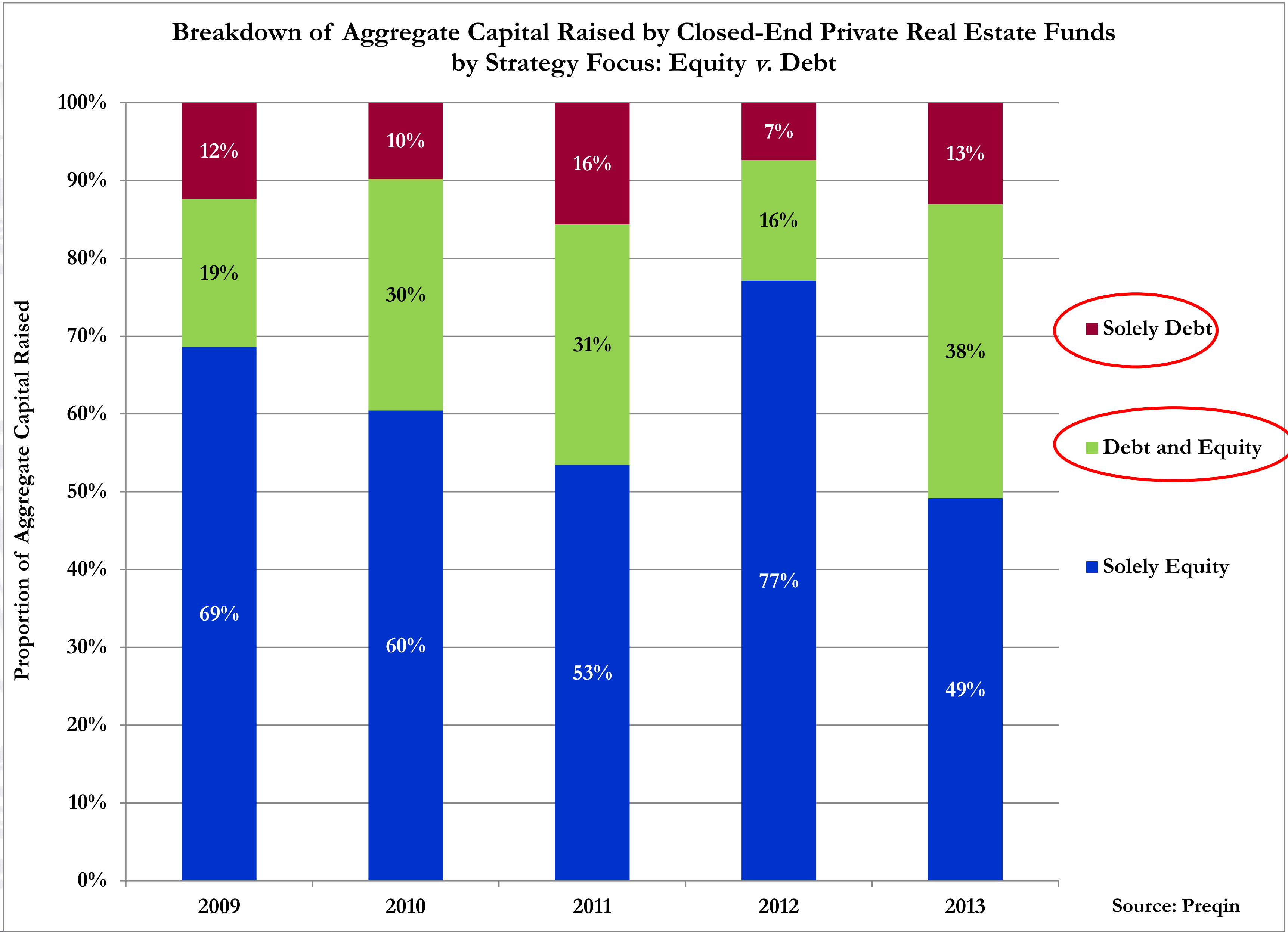
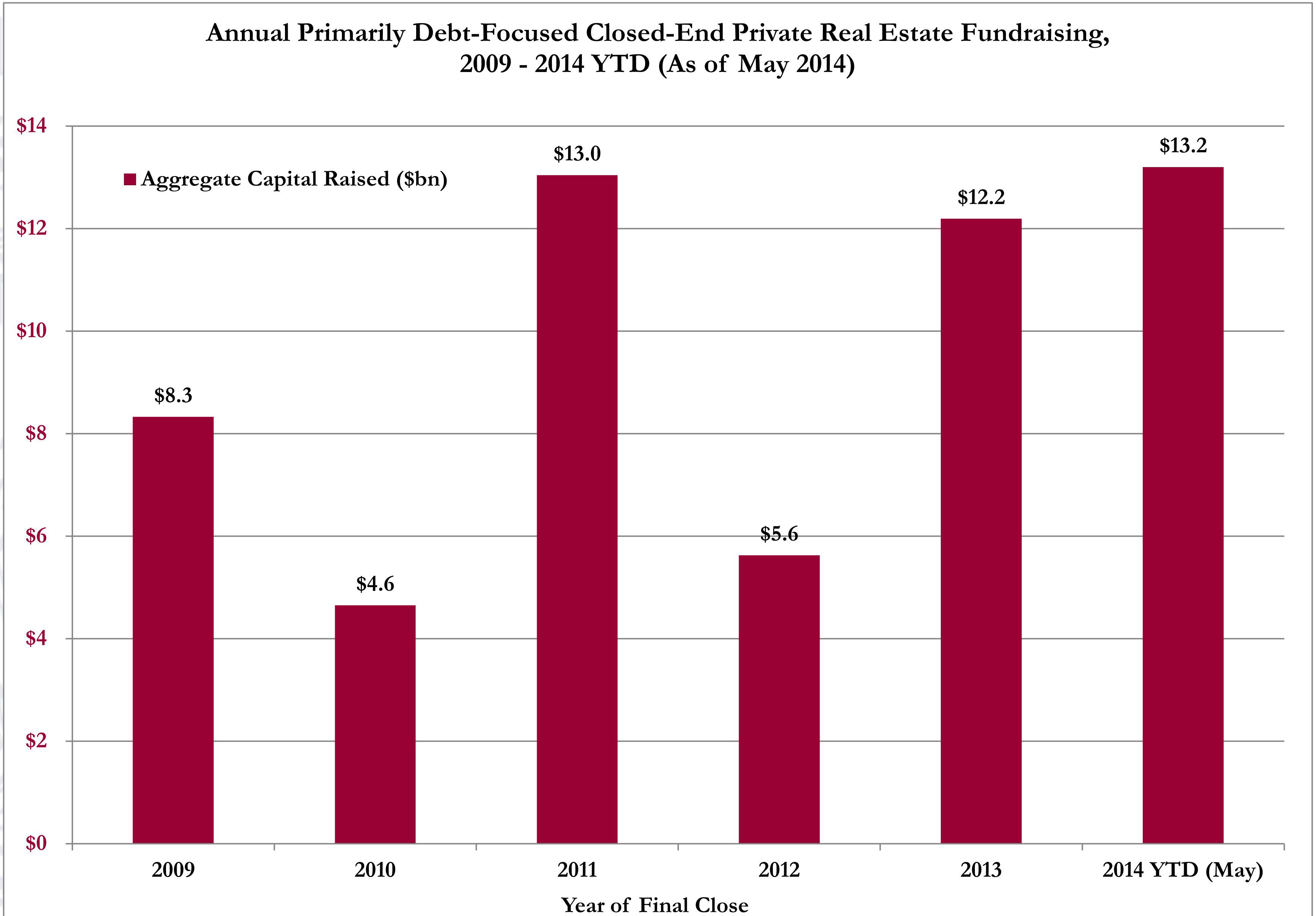
Overview: Fund-Raising Efforts



Overview: Fund-Raising Efforts by Focus



Overview: Fund-Raising Efforts



Source: Preqin

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. (Michael Eglit?)

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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	1000	9.82%
Equity	$1,000	14.40%

Notes:

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

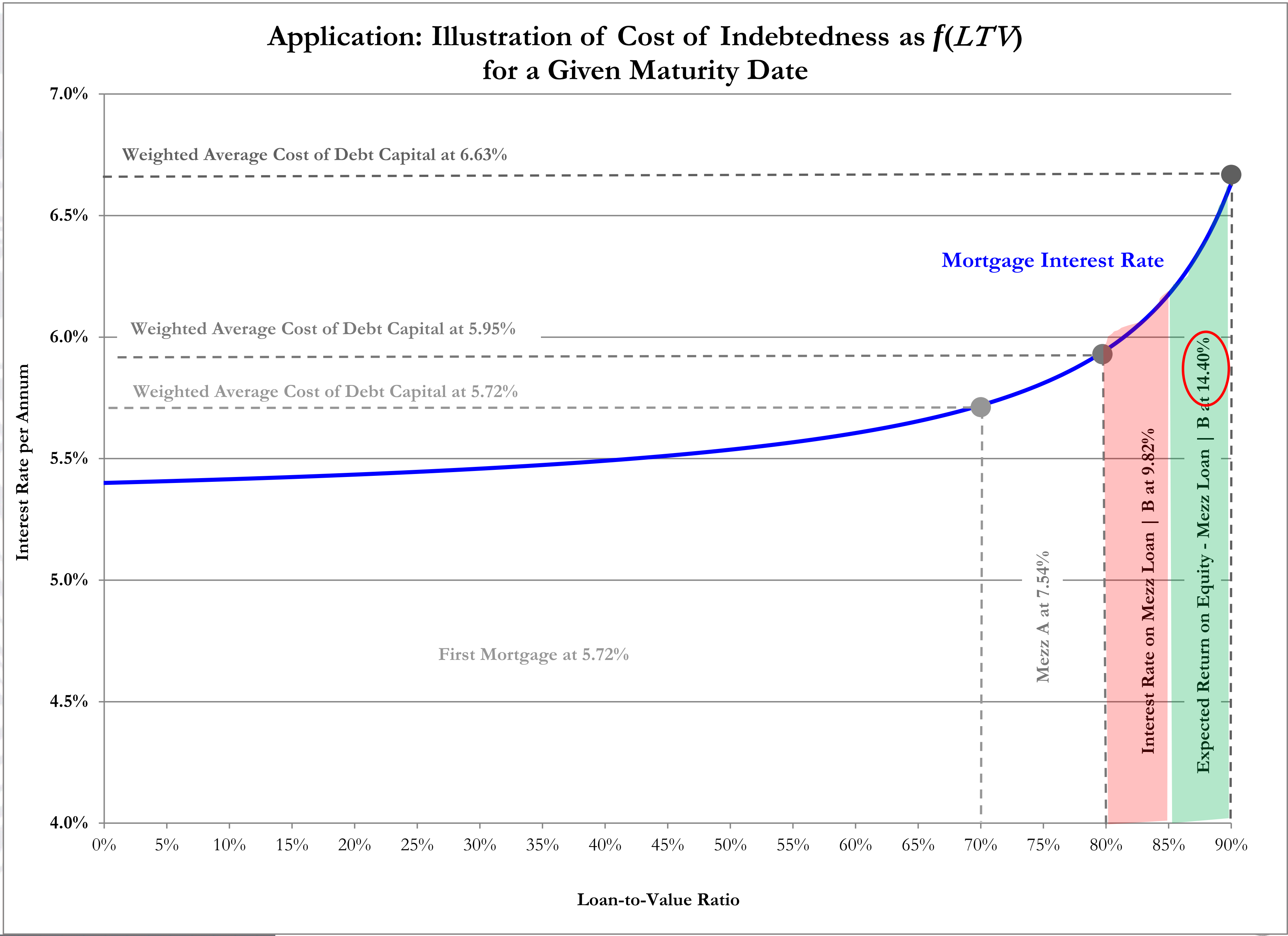
   tranches B1 and B2

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)



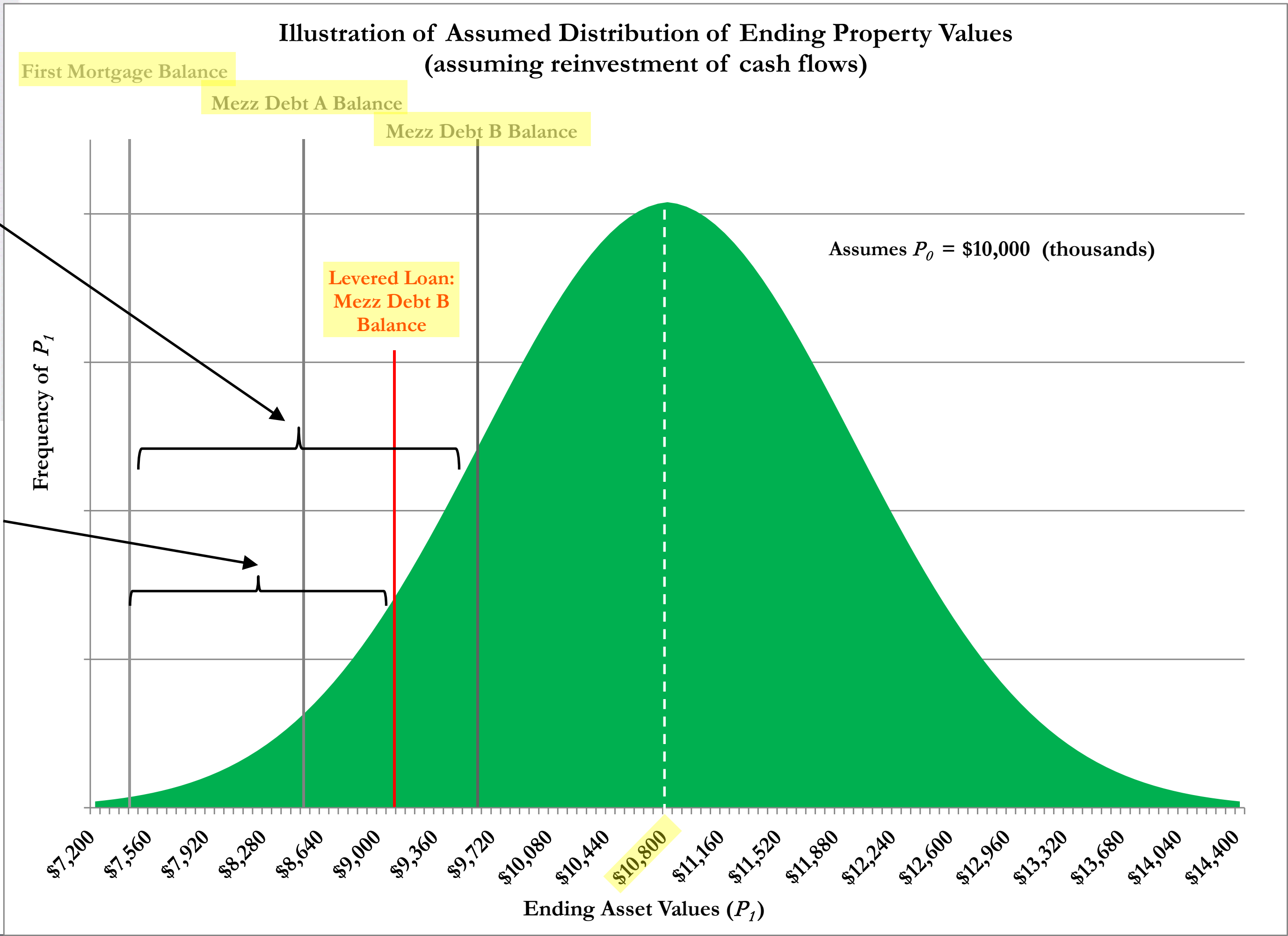
Levered Loans: A Few Thoughts

- 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%

∴ $E\{k\} < 14.4\% \{ = f(\sigma)\}$
[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



Levered Loans: A Few Thoughts (continued)

- Levered loans are not much different from what banks do.
- During the financial crisis, consider the leverage embedded in certain banks ⇒ a systemic risk to the financial system

DISTRESSING SITUATION

Banks hold $1.5 trillion in commercial-realty loans. While the biggest institutions have the largest amount by total value, the largest risks could be at regional banks, which have a higher percentage of their assest in these shaky obligations.

	Commercial-Real Estate Loans				
Bank/Ticker	Total (bil)	As % of Total Loans	Tangible Equity as % of Tangible Assets		Debt-to-Equity Ratio
B of A/BAC	$112.3	11.6%	3.1%		31.3:1
BB&T/BBT	36.1	36.7	5.1%		18.6:1
Citigroup/C	77.5	10.6	4.3%	*	22.3:1
Fifth Third/FITB	21.0	24.7	3.9%		24.6:1
JPMorgan/JPM	68.2	8.9	4.3%		22.3:1
KeyCorp/KEY	18.9	24.6	6.1%		15.4:1
PNC/PNC	38.5	21.4	6.0%		15.7:1
Regions/RF	40.6	40.9	5.4%		17.5:1
SunTrust/STI	26.3	19.8	5.9%		15.9:1
US Bancorp/USB	32.4	18.2	4.7%		20.3:1
Wells Fargo/WFC	142.1	15.9	3.7%		26.0:1

*After Citi's preferred conversion. Source: Morgan Stanley

As reported in: Andrew Barry, "The Other Shoe," ***Barron's***, May 4, 2009

Leverage ratios generally in excess of 95%!

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Some Thoughts on Leverage, Fees & Returns

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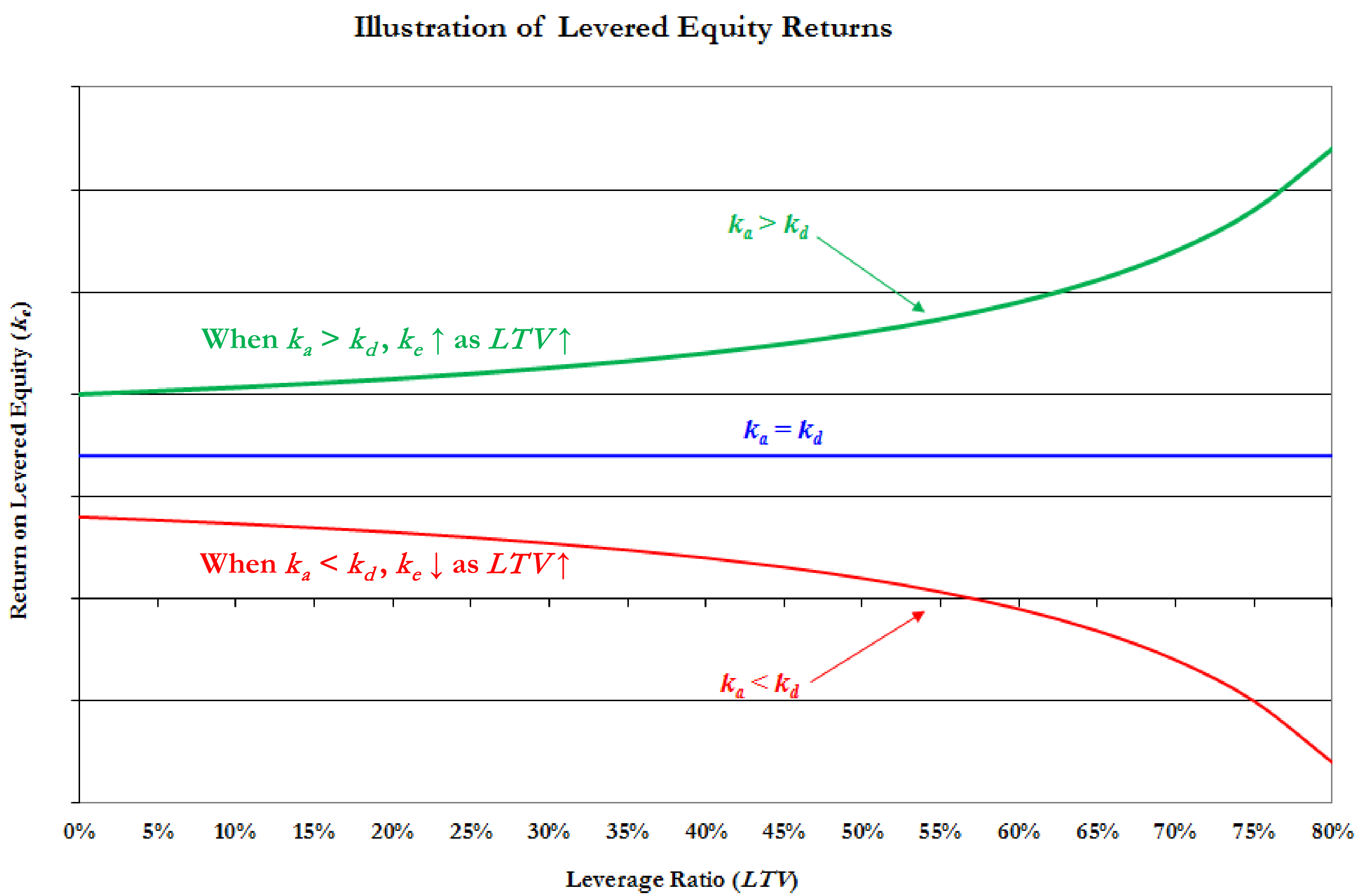
Recall: The Return on Levered Equity

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

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



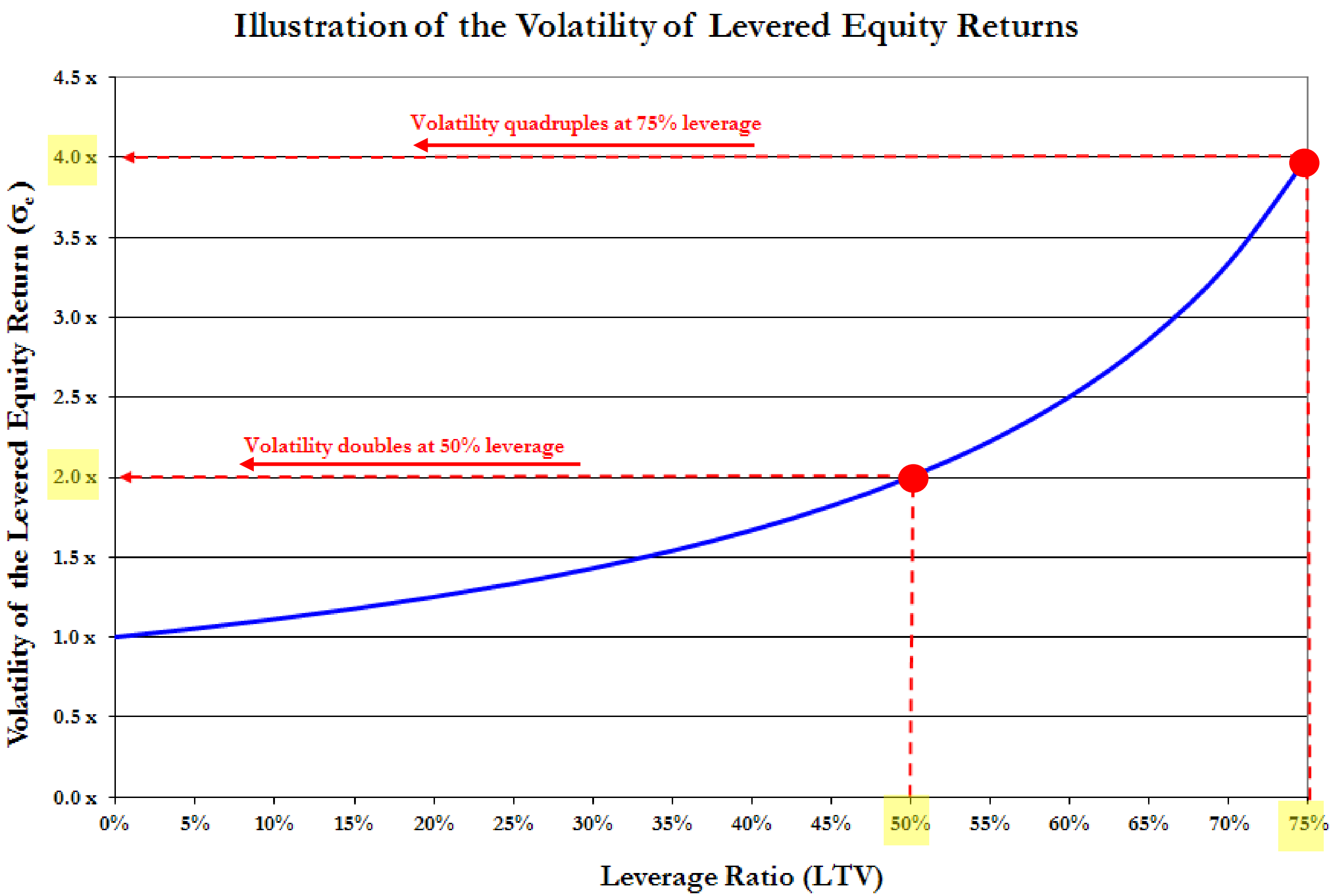
Note:

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:

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

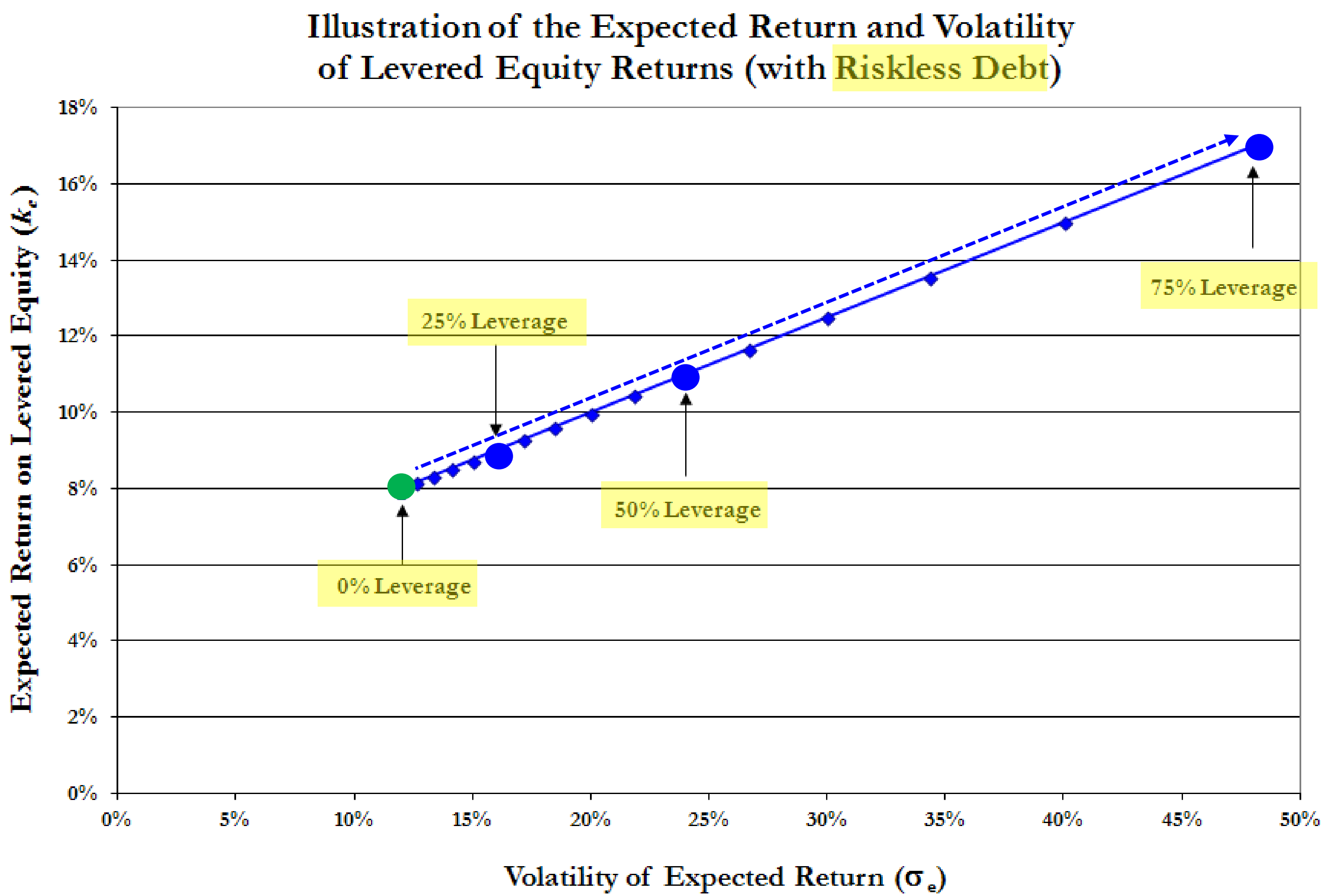


Note:

This illustration assumes fixed-rate financing

Recall: Combining Risk & Return

- As before, let's assume: $\kappa_a = 8\%$ and $\sigma_a = 12\%$ ← ~ core **returns**
- Then, can lever up core to create risk/return continuum



Note:

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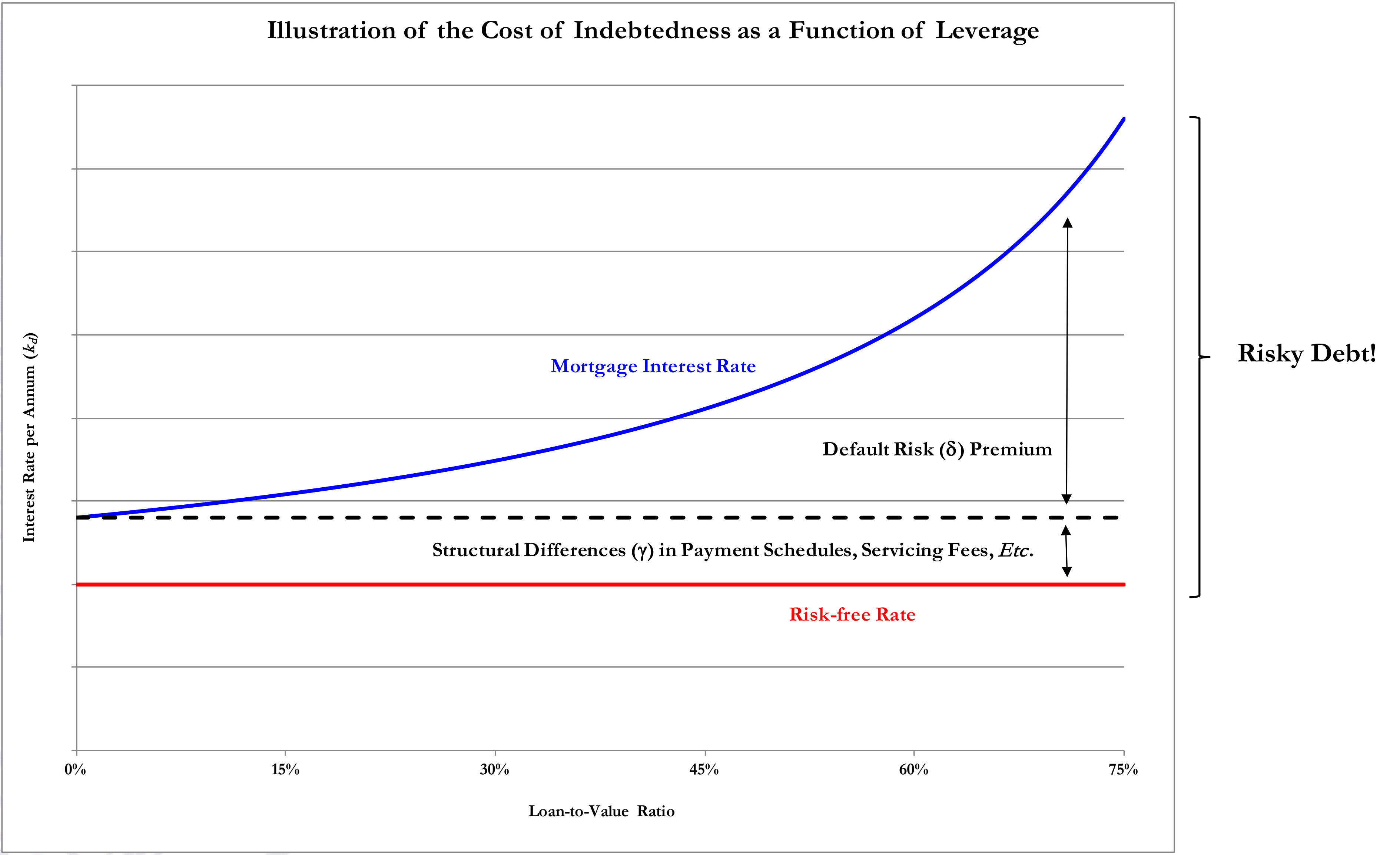
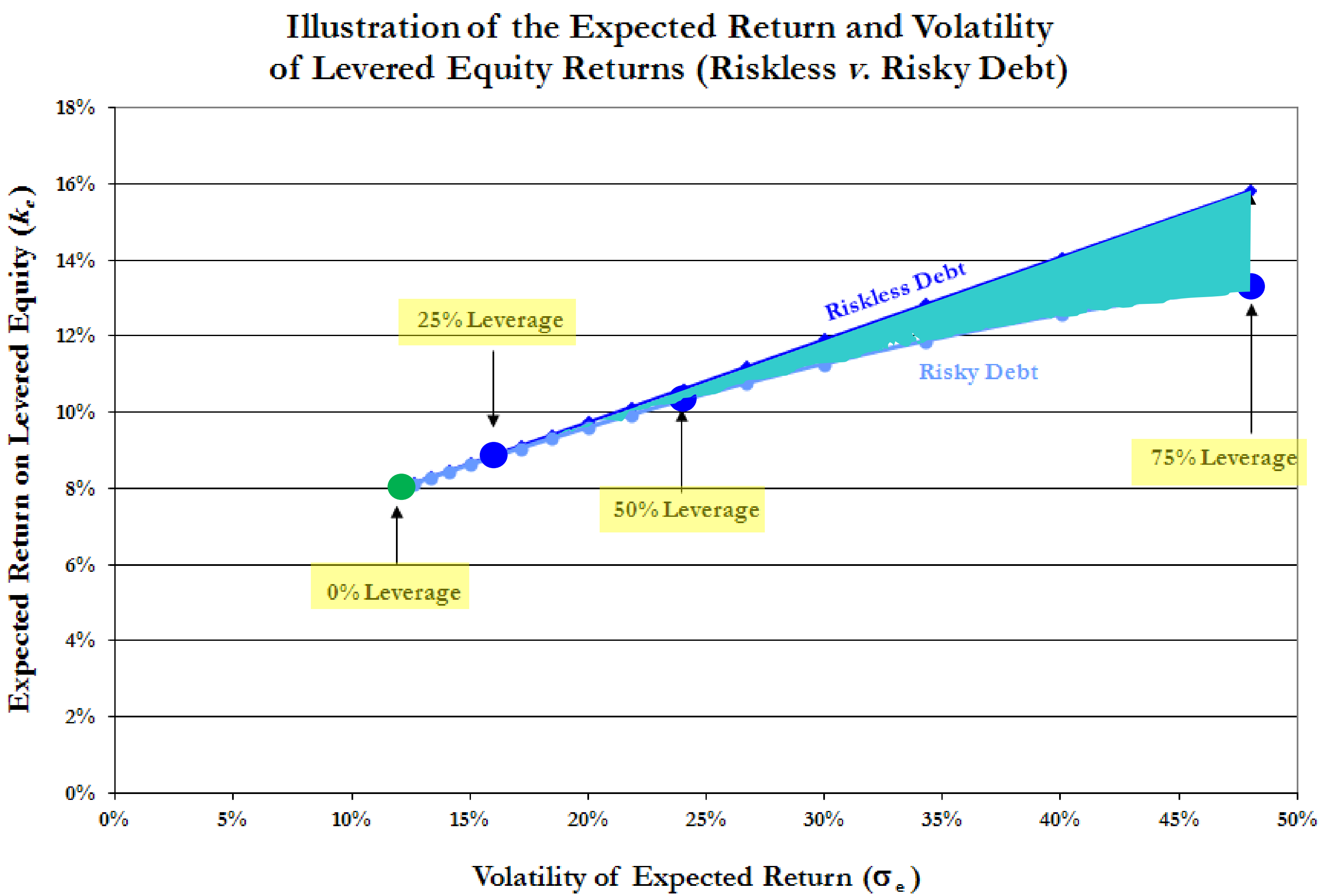
Recall: Interest Rates =*f*(*LTV*| Asset Quality, Sponsorship, *etc.*)

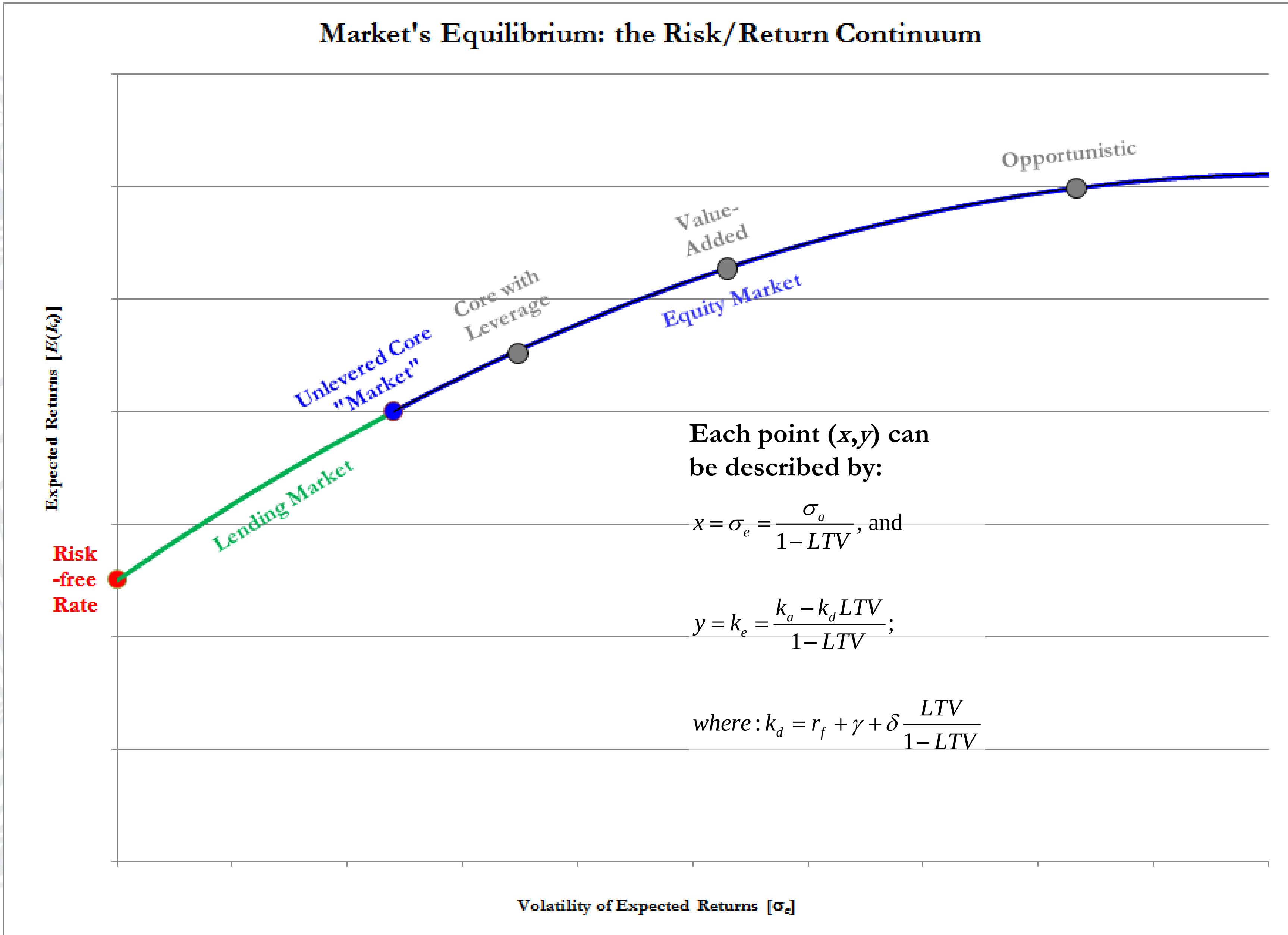


Modifying Risk & Return Continuum ← Risky Debt

- As before, let's assume: κ_a = 8% and σ_a = 12% ← ~ **core returns**
- With risky debt [=*f*(*LTV*)], continuum becomes a curve



The Equilibrium Condition: The Law of One Price



Each point (*x*,*y*) can be described by:

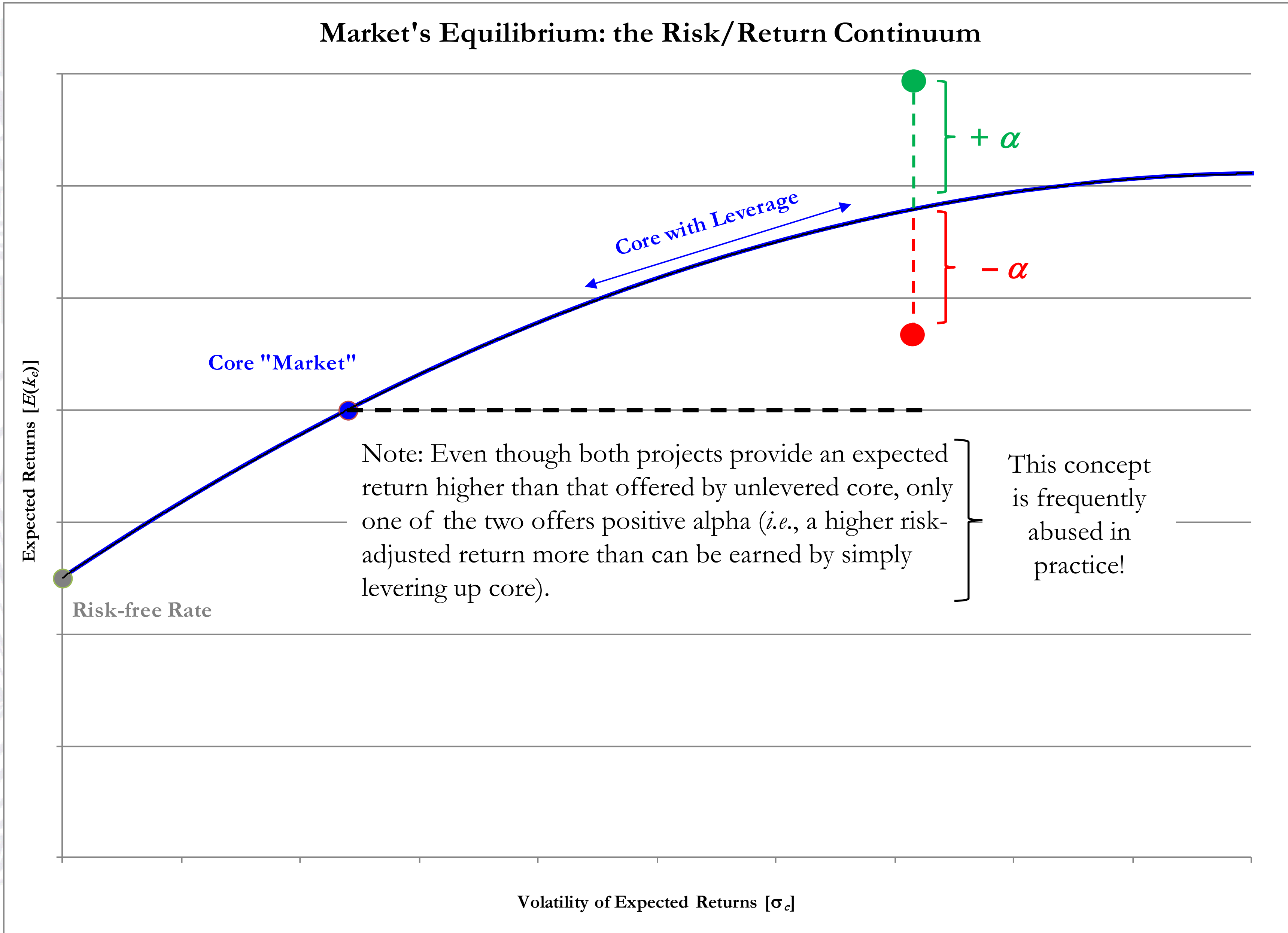
$$x = \sigma_e = \frac{\sigma_a}{1 - LTV}, \text{ and}$$

$$y = k_e = \frac{k_a - k_d LTV}{1 - LTV};$$

$$where: k_d = r_f + \gamma + \delta \frac{LTV}{1 - LTV}$$

The Equilibrium Condition → Alpha!

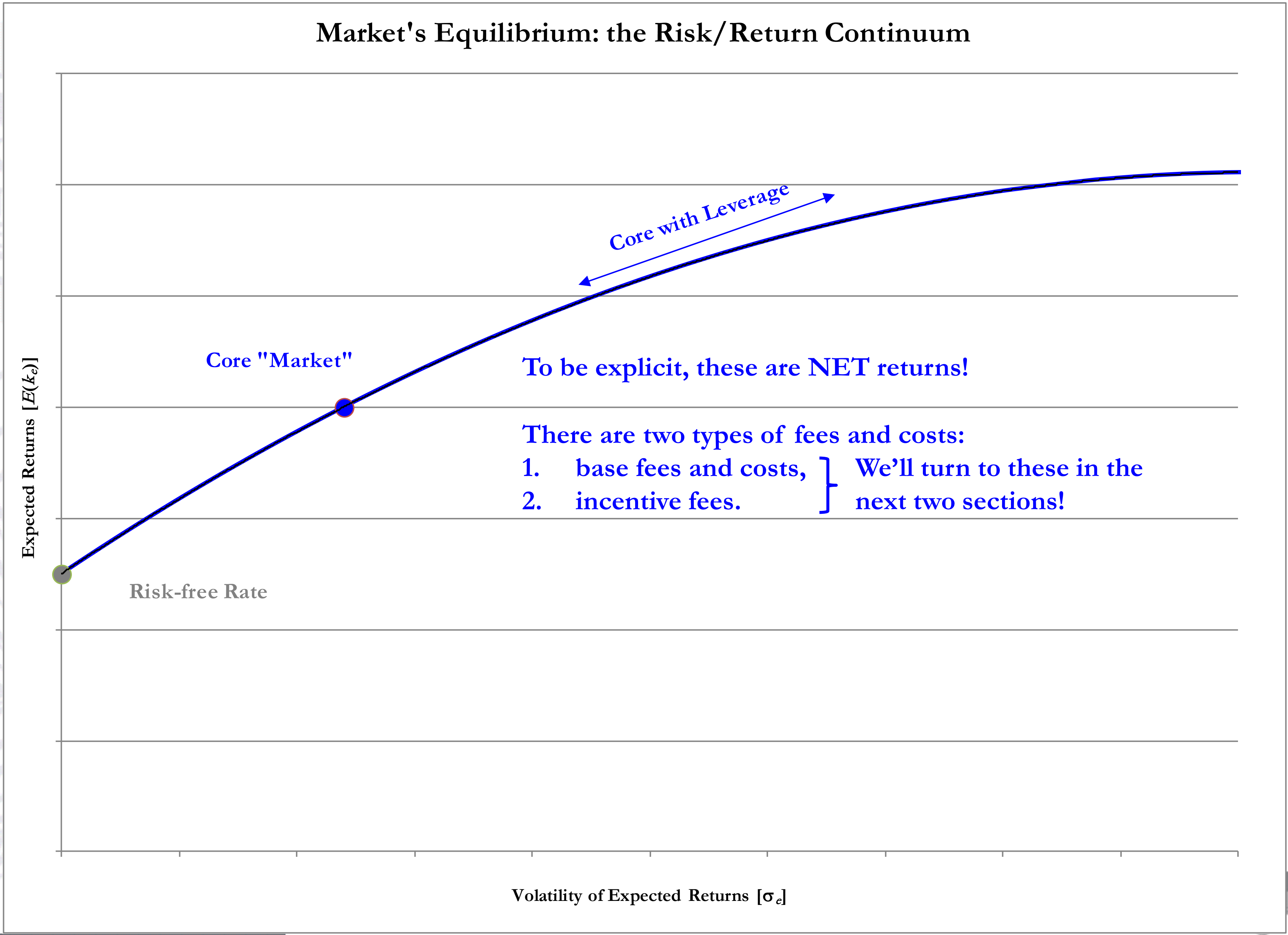
Let's look at two possible deals



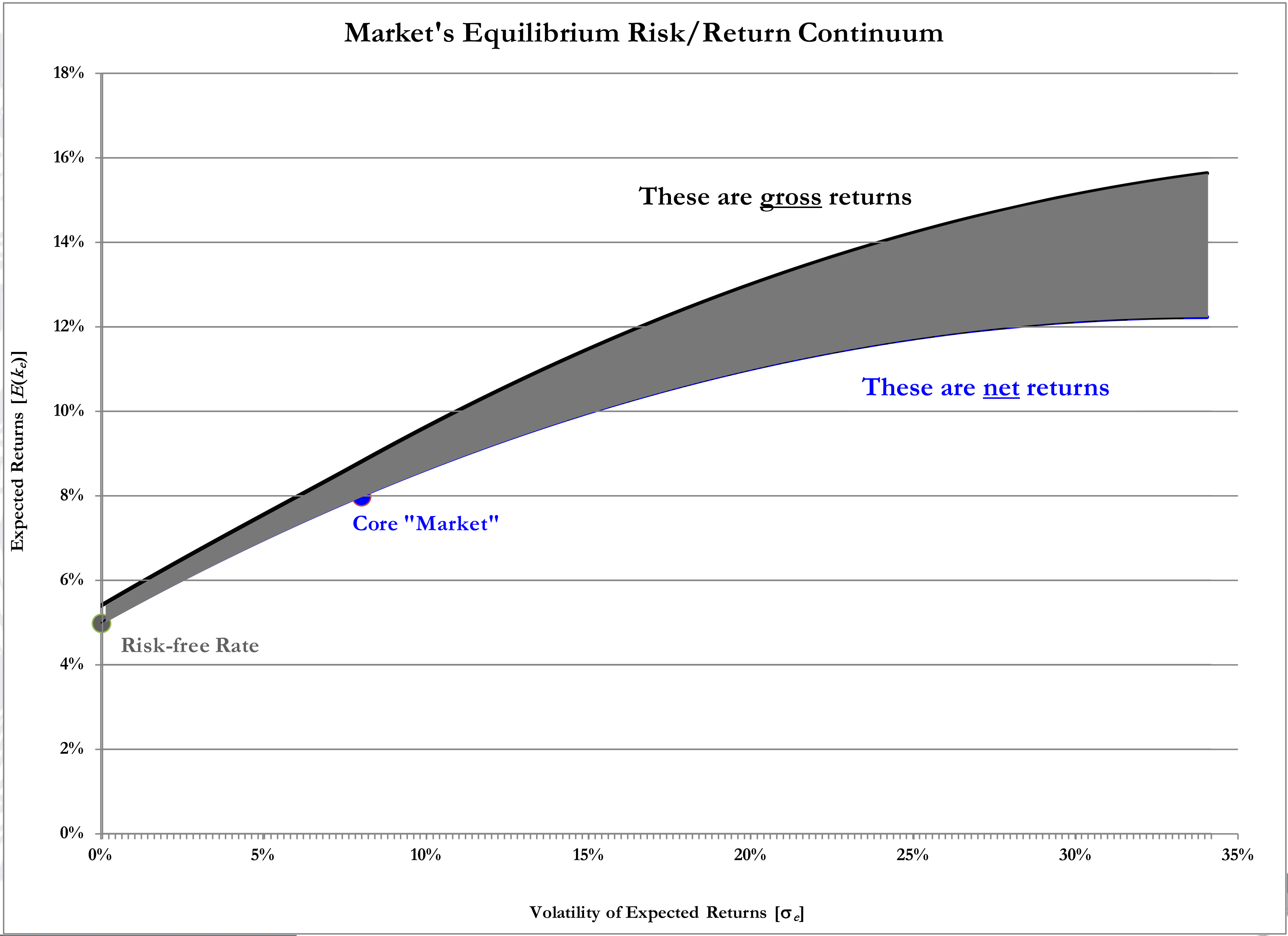
Note: Even though both projects provide an expected return higher than that offered by unlevered core, only one of the two offers positive alpha (*i.e.*, a higher risk-adjusted return more than can be earned by simply levering up core).

This concept is frequently abused in practice!

The Equilibrium Condition ← Net Returns

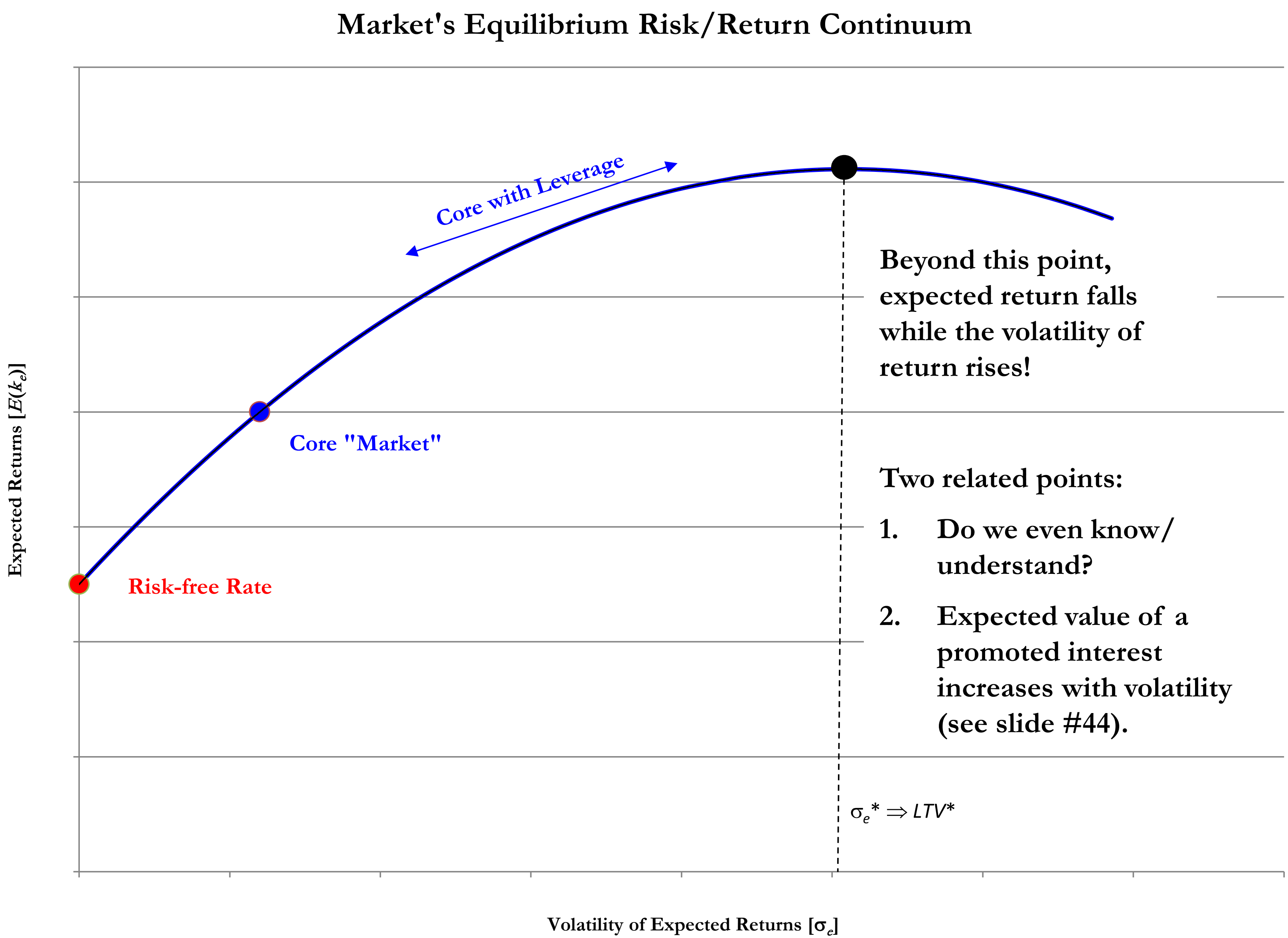


The Equilibrium Condition ← Net Returns (continued)



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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Types of Base Fees & Costs

- Essentially there are three types of base fees & costs:
  1. Acquisition (& loan origination) fees & costs ("*A*")
  2. Ongoing investment management fees & costs ("*O*")
  3. Disposition fees & costs ("*D*")
- Each of these fees & costs acts as a drag on returns

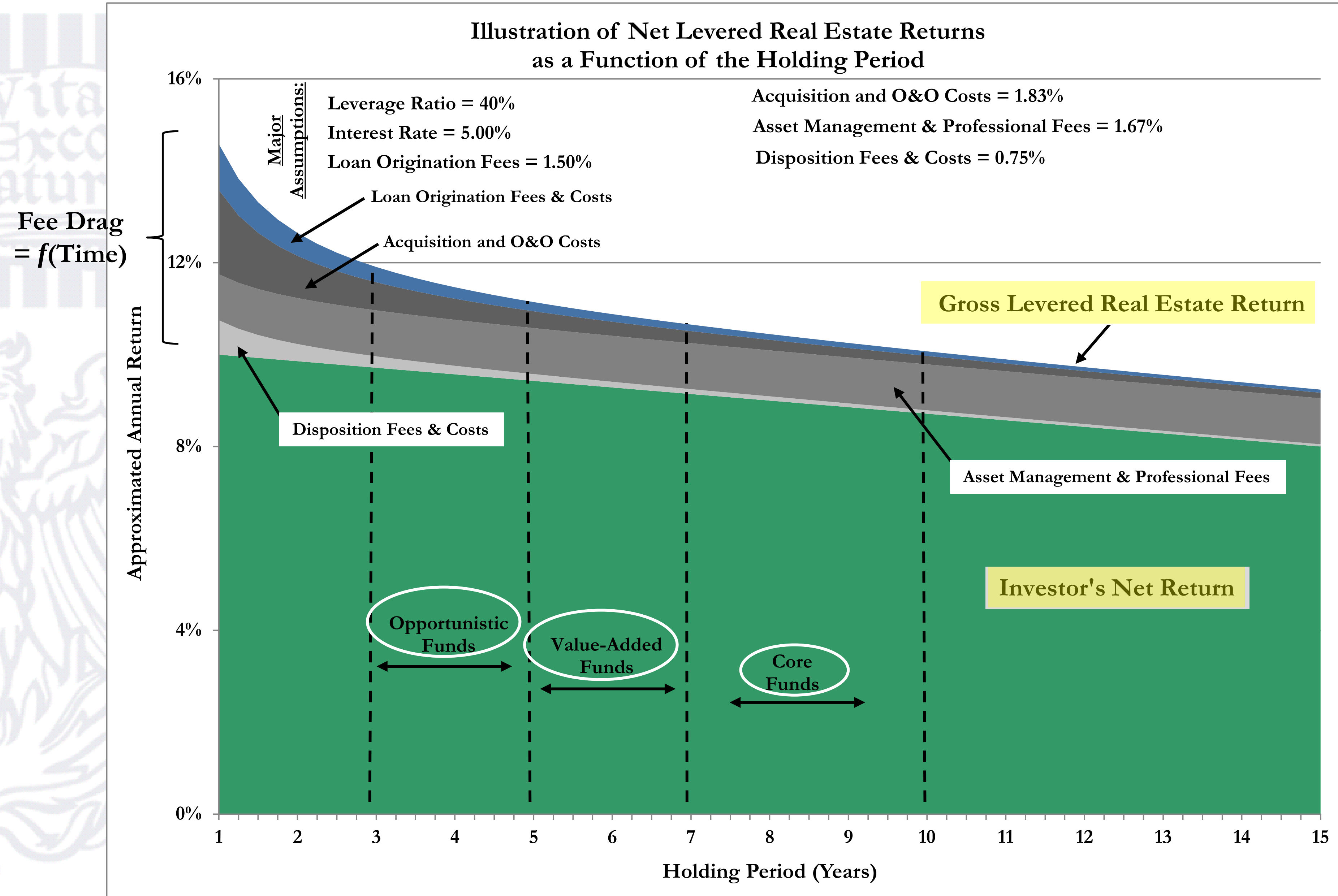
The Return Drag of Fees & Costs

- Assumptions:
  - The property is to be held for T years
  - The property produces an annual gross return of y
- As an approximation, the fee drag of each type is as follows:
  1. Acquisition (& loan origination) fees & costs: A/T

     In the very long run, the drag on returns $\approx \frac{A}{1+A}$
  2. Ongoing investment management fees & costs: O
  3. Disposition fees & costs: $\sqrt[T]{1+D}-1$
- Therefore, the gross return's conversion to a net return:

$$y-\left(\frac{A}{T}+O+\sqrt[T]{1+D}-1\right)$$

An Example of the Return Drag of Fees & Costs



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Numerical Example: Pref & Promote Structure

Fund-Level Return Distribution:

Gross Return	13.0%
Base Fees	1.0%
Net Return before the Promote	12.0%
Volatility	15.0%

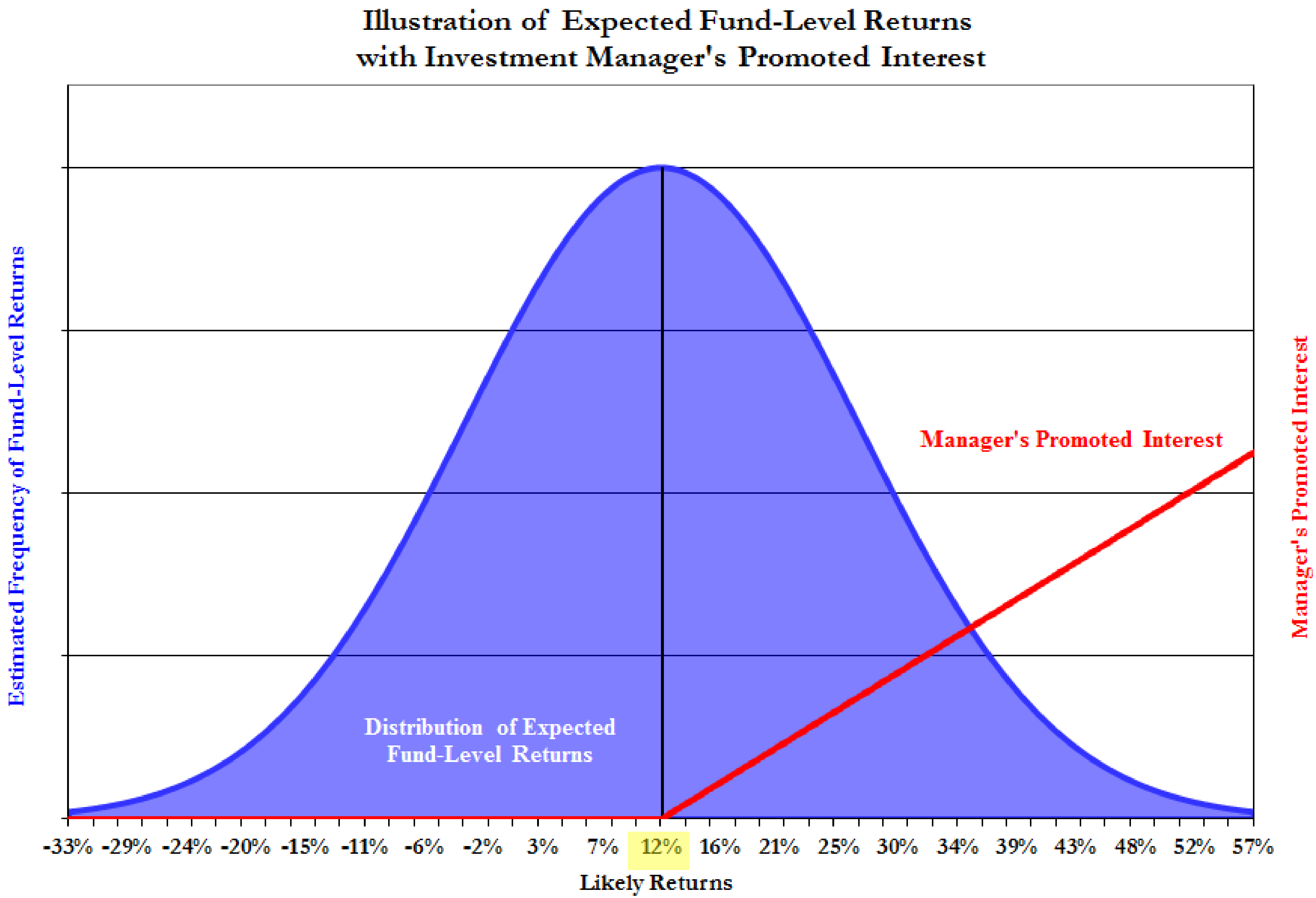
Fund Structure:

Investor's Preference	12.0%
Residual Split:	
– Investor	80%
– General Partner	20%

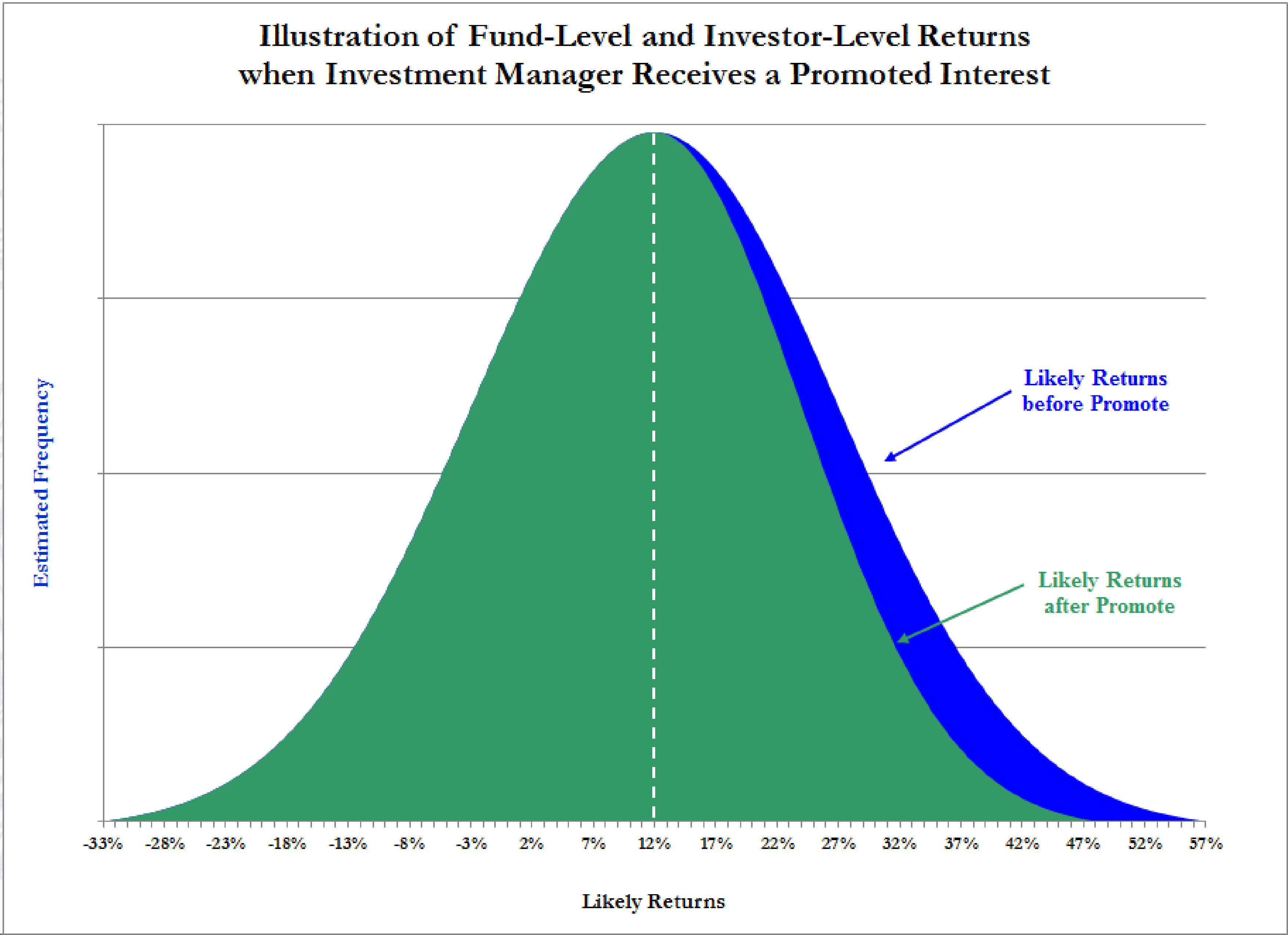
Notes:

- Investor's preference typically set at or below fund's likely return.
- The general partner's "promoted" interest creates an option-like return for operator.
- The value of the option reduces the investor's upside.

"Promote" → Asymmetric Participation | Contingent Claim



Promotes Truncate the Investor's "Upside" Return



Numerical Example (continued)

Fund's Gross and Net Returns:

– Likely Returns:

Gross Return	13.0%
Ongoing/Base Fees	1.0%
Operating Partner's Participation	1.2%
Investor's Net Return	10.8%

– Volatility (Standard Deviation):

Fund-Level Volatility before General Partner	15.0%
General Partner's Participation	1.5%
Investor's Net Return	13.5%

Notes:

– The general partner's "promoted" interest reduces the investor's net return by 120 bps:
  Even though the value of the promote equals zero at the most likely return,
  This is attributable to general 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.

Point #1: Average Expectation ≠ Expectation of the Average

A simple way to the think of the average promote:

Simple, Two-Outcome Illustration of Asymmetric Payoffs				
Outcomes	Probability	Gross Returns	Promote	Net Returns
Outcome_1	50%	24.0%	2.4%	21.6%
Outcome_2	50%	0.0%	0.0%	0.0%
Average		12.0%	**1.2%**	**10.8%**

Note: The appropriate way to calculate the expected promote:

$$E(\pi)=\int_{\psi}^{\infty}\kappa(x-\psi)f(x)dx$$

where: π = the "promote", κ = general partner's participation in the excess profits, ψ = investor's preference, and *f*(*x*) = the distribution of fund-level returns, *x*.

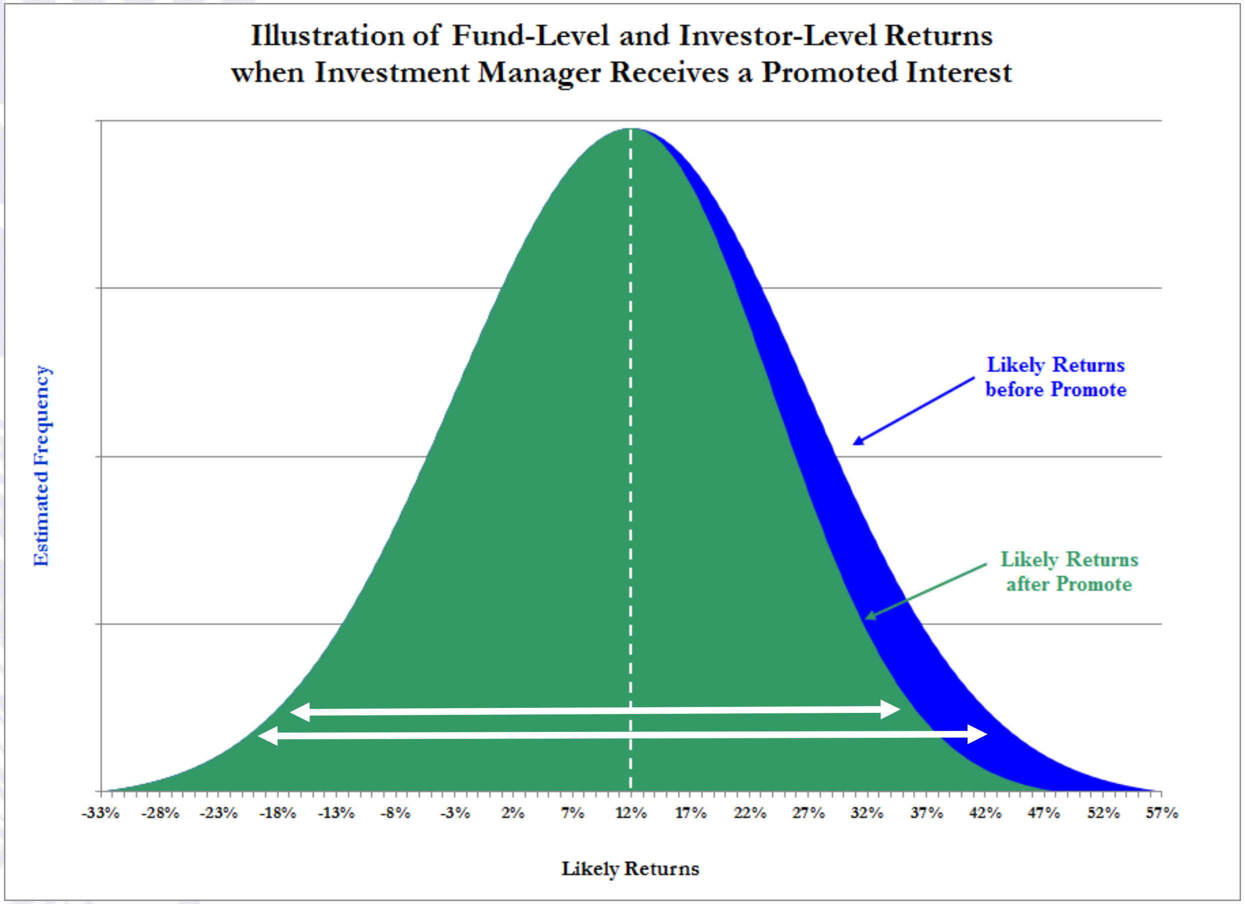
Because of the general partner's asymmetric participation:

- **The average expectation does not equal the expectation of the average :**

$$E(\pi)=\int_{\psi}^{\infty}\kappa(x-\psi)f(x)dx\neq\kappa(\overline{x}-\psi)$$

Point #2: Reduction in Volatility of Net Returns ← An Illusion

Mathematically, it is true that the dispersion in net returns is narrower:



However, the investor retains all the “downside” risk

- Therefore, investor faces the same risk as before the promote
- This is an important point when examining index returns by strategy

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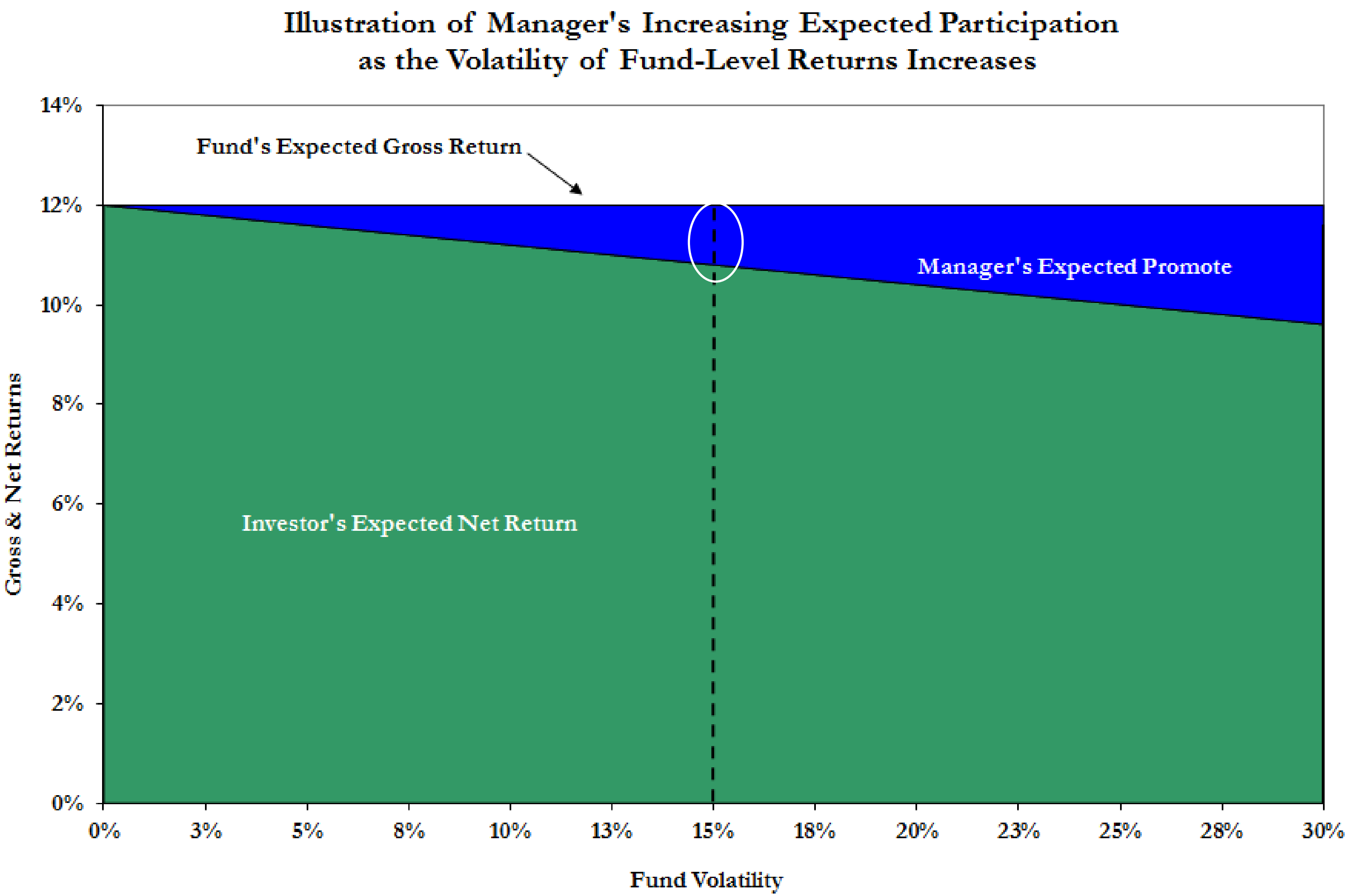
Point #3: E(Promote) = *f*(Volatility)

Changing nothing else, here's an illustration of how the expected value of the promoted interest changes with the project's volatility (σ):

σ = *f*(•):

- property type,
- geography,
- life cycle,
- tenancy,
- LEVERAGE,
- GP,
- *etc.*



Conclusion: Non-Core > Core ?

- Do <u>risk-adjusted</u> non-core returns outperform core?
- The initial analyses suggest otherwise!

See PREA study, the most-recent issue of *Capital Ideas*, and last year's conference presentation.