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The University of Chicago Booth School of Business

Some Thoughts on Past & Future Real Estate Returns

Joseph L. Pagliari, Jr.
Clinical Professor of Real Estate

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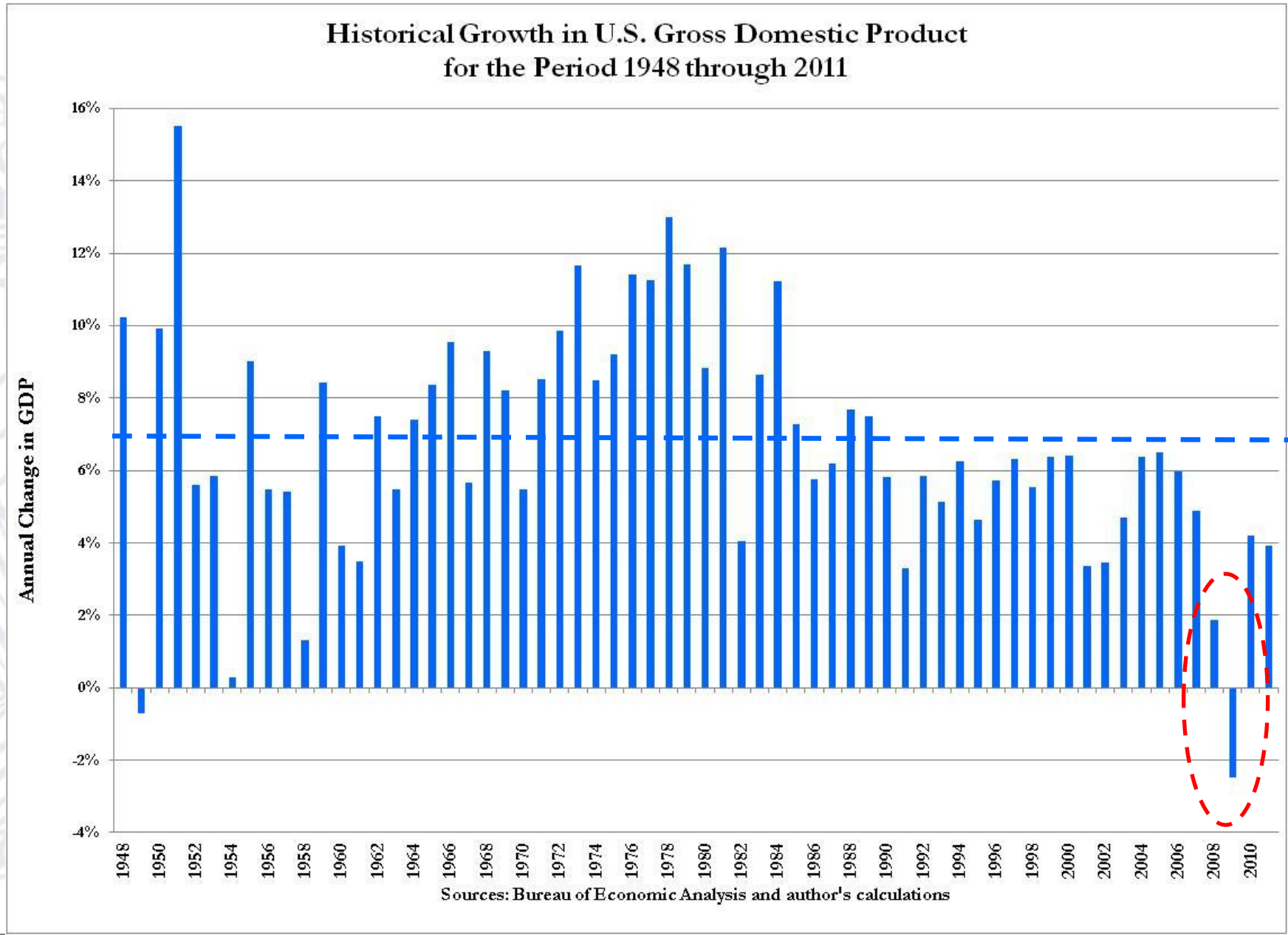
Commercial Real Estate: Past & Future(?)

- Macro Factors Affecting Real Estate Returns:
  - The Economy
  - The Housing Market
  - State & Local Finances
  - Loan Maturities
  - Commercial Real Estate Pricing
  - Too Much Growth!
  - Inflation?
  - Some Thoughts on Multi-Family
- Appendices
  - Growth at What Price?
  - CMBS Dysfunction

Return = *f*(Economy, *etc.*) | The Long View



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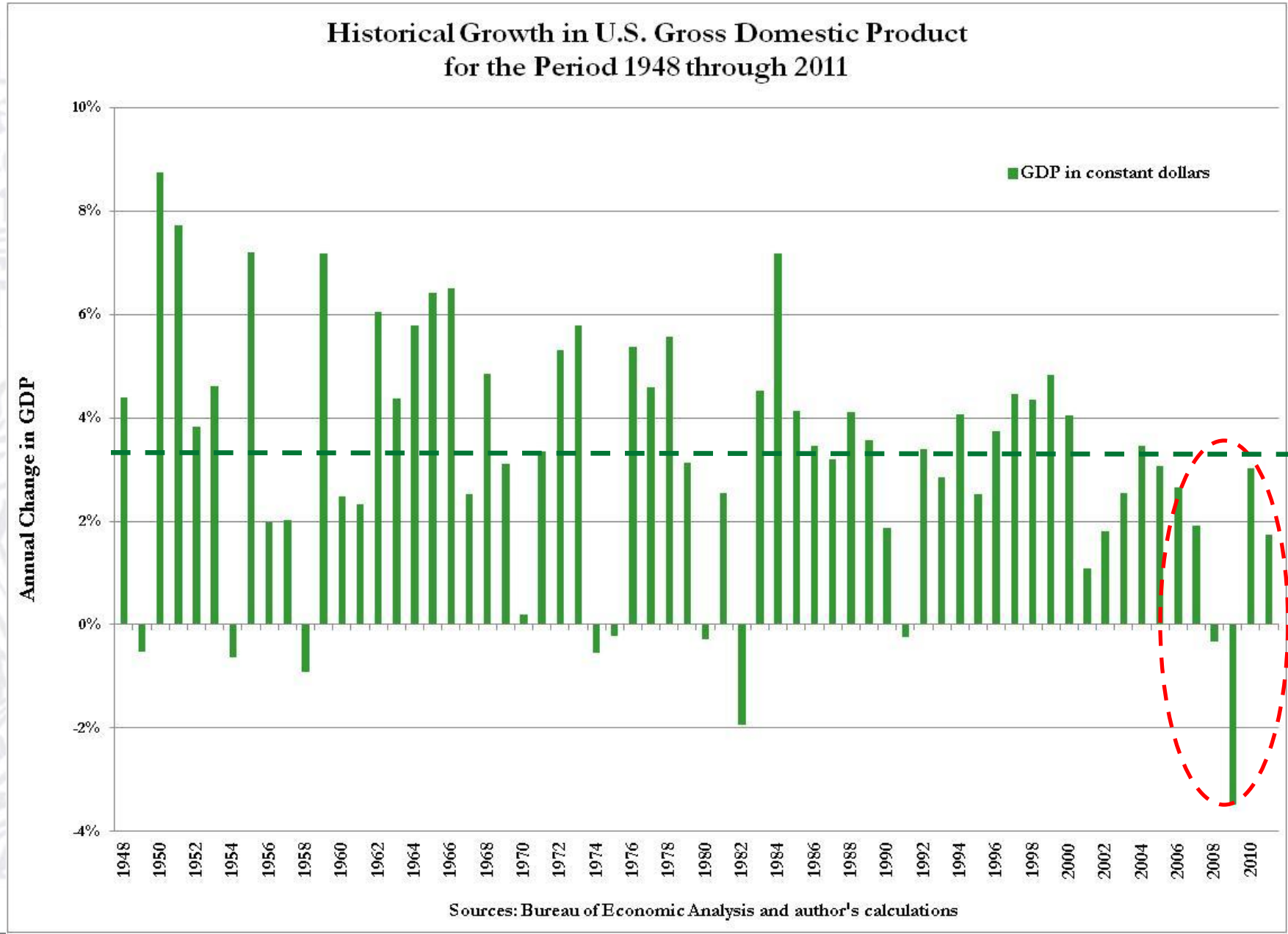
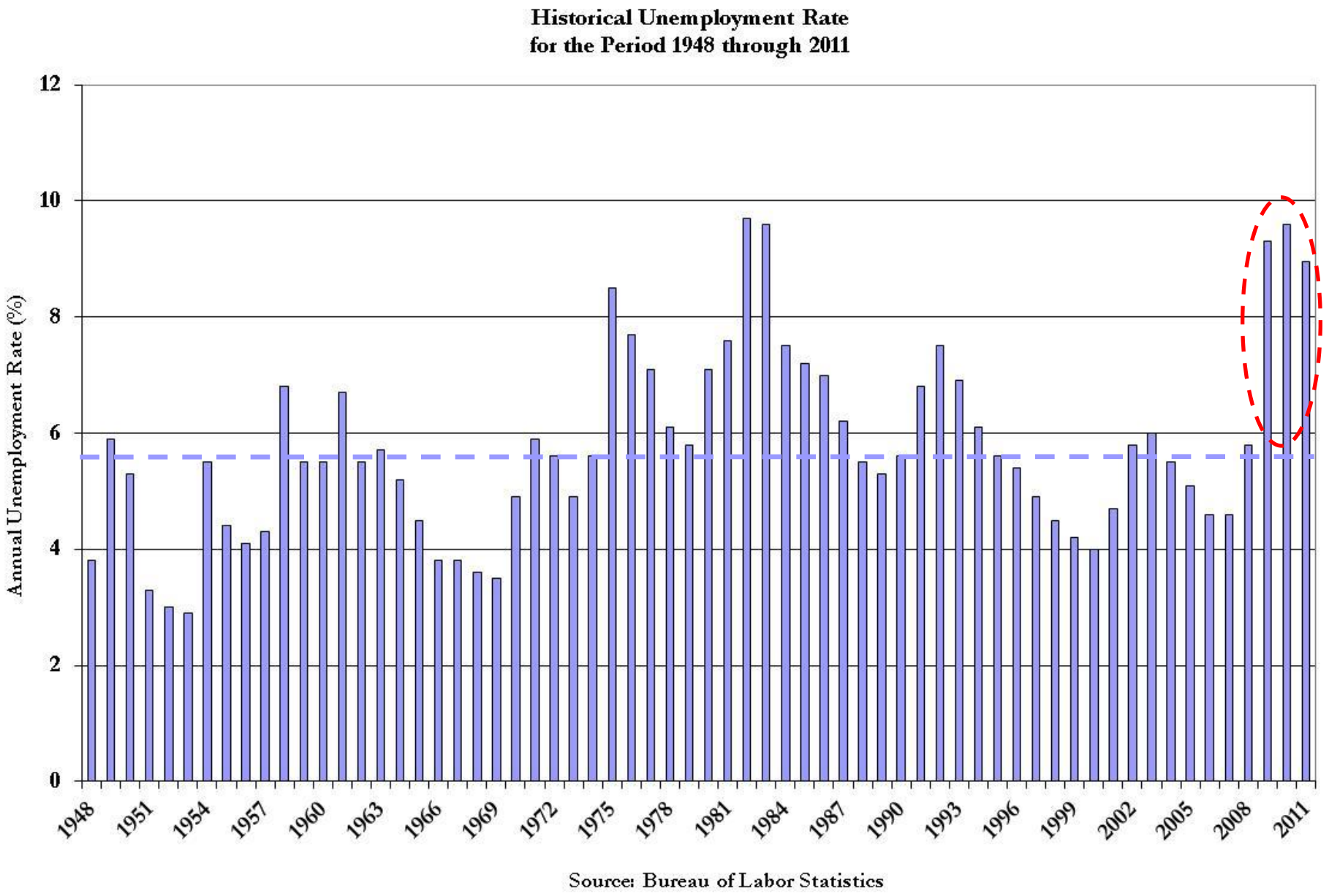


Return = *f*(Employment, *etc.*) | The Long View



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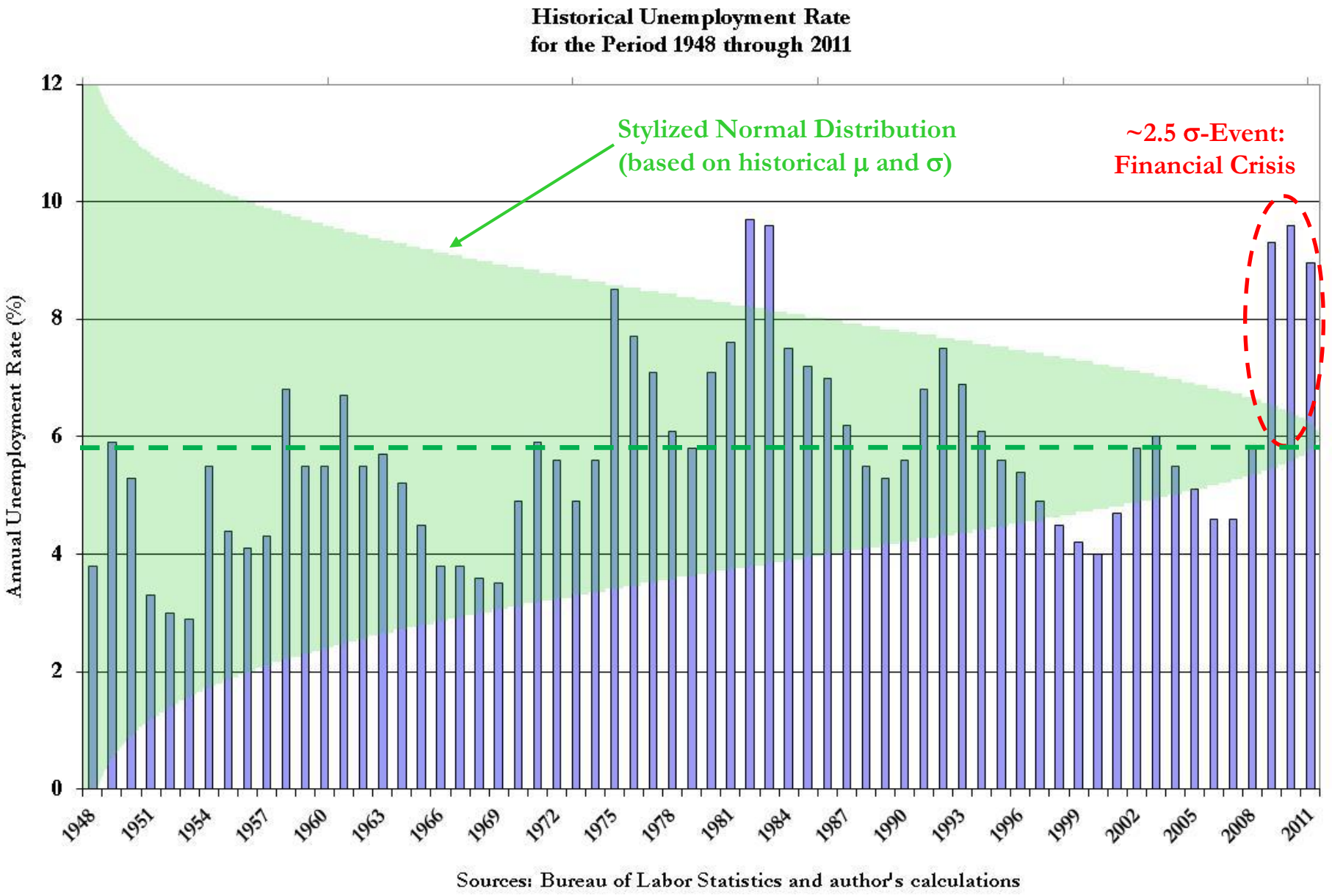
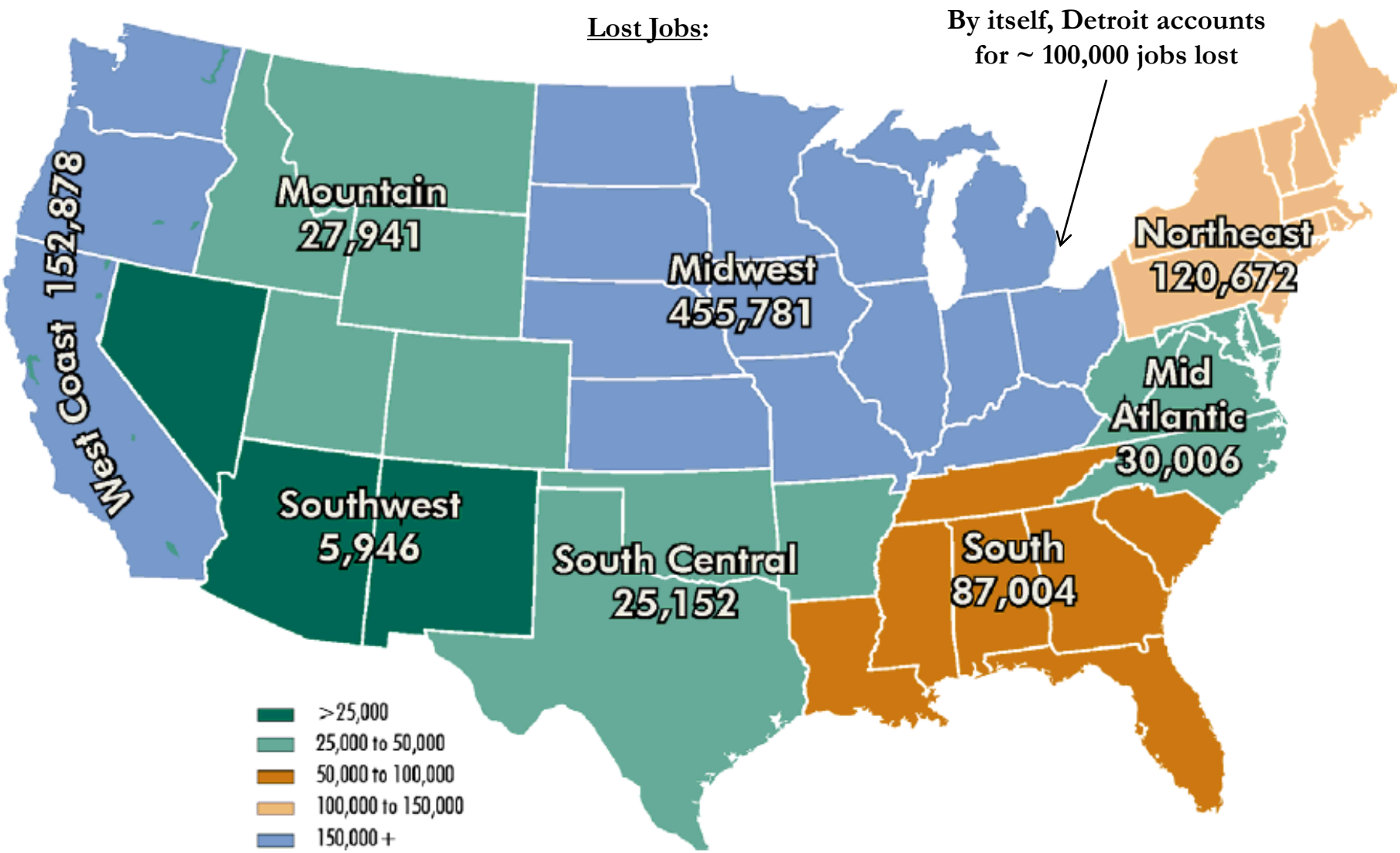


In Real Estate, the Local Market Matters!



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

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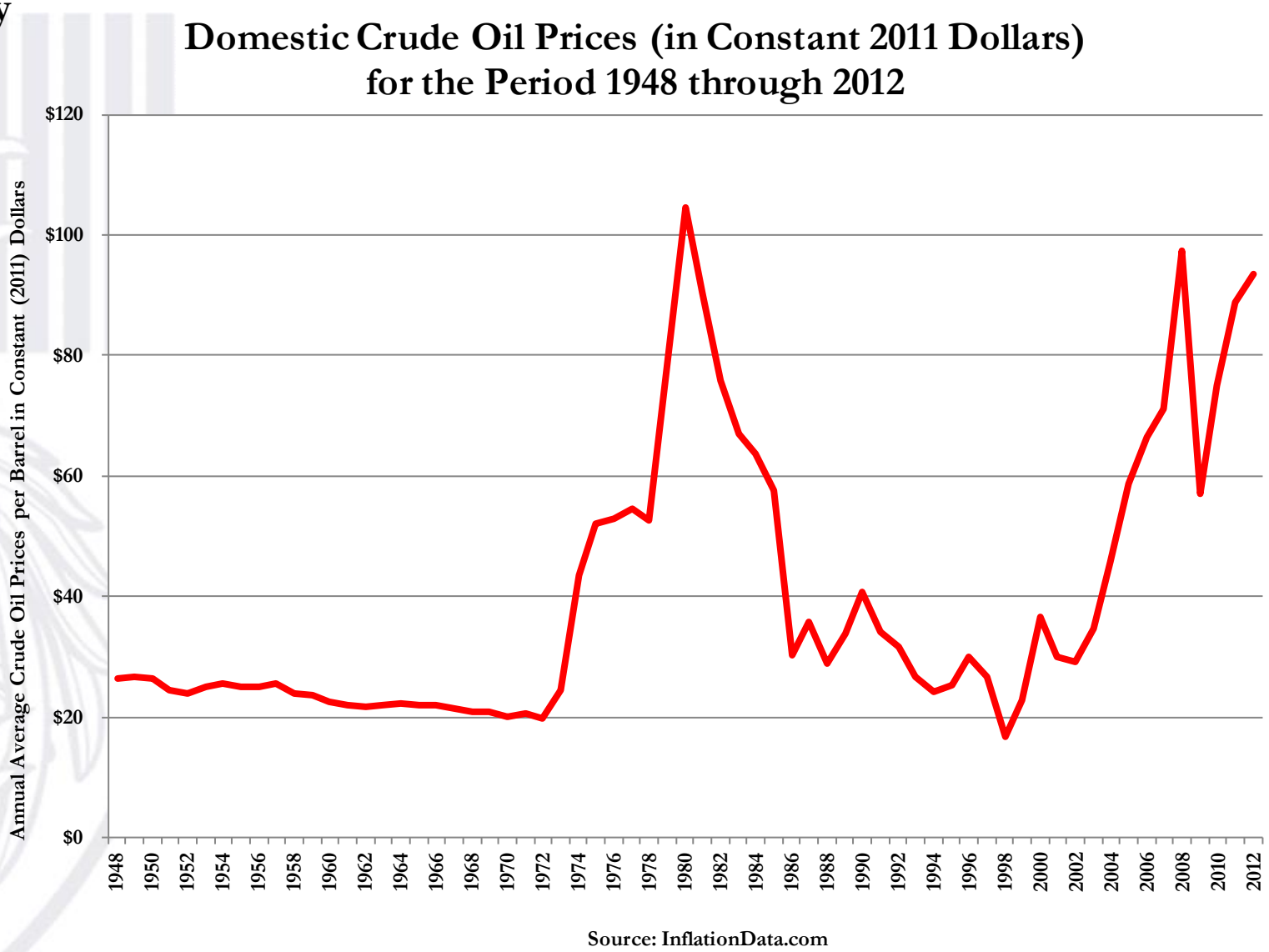
What Might Derail the Economy? The Long View on Oil Prices

- The economy remains fragile.
- What else might go wrong?
- Possibilities:
  - Terrorist attack(s)?
  - Contagious financial crisis?
  - Natural disasters (Sandy)?
  - Partisan political bickering increases (fiscal cliff)?
  - Crude oil prices?



Source: InflationData.com

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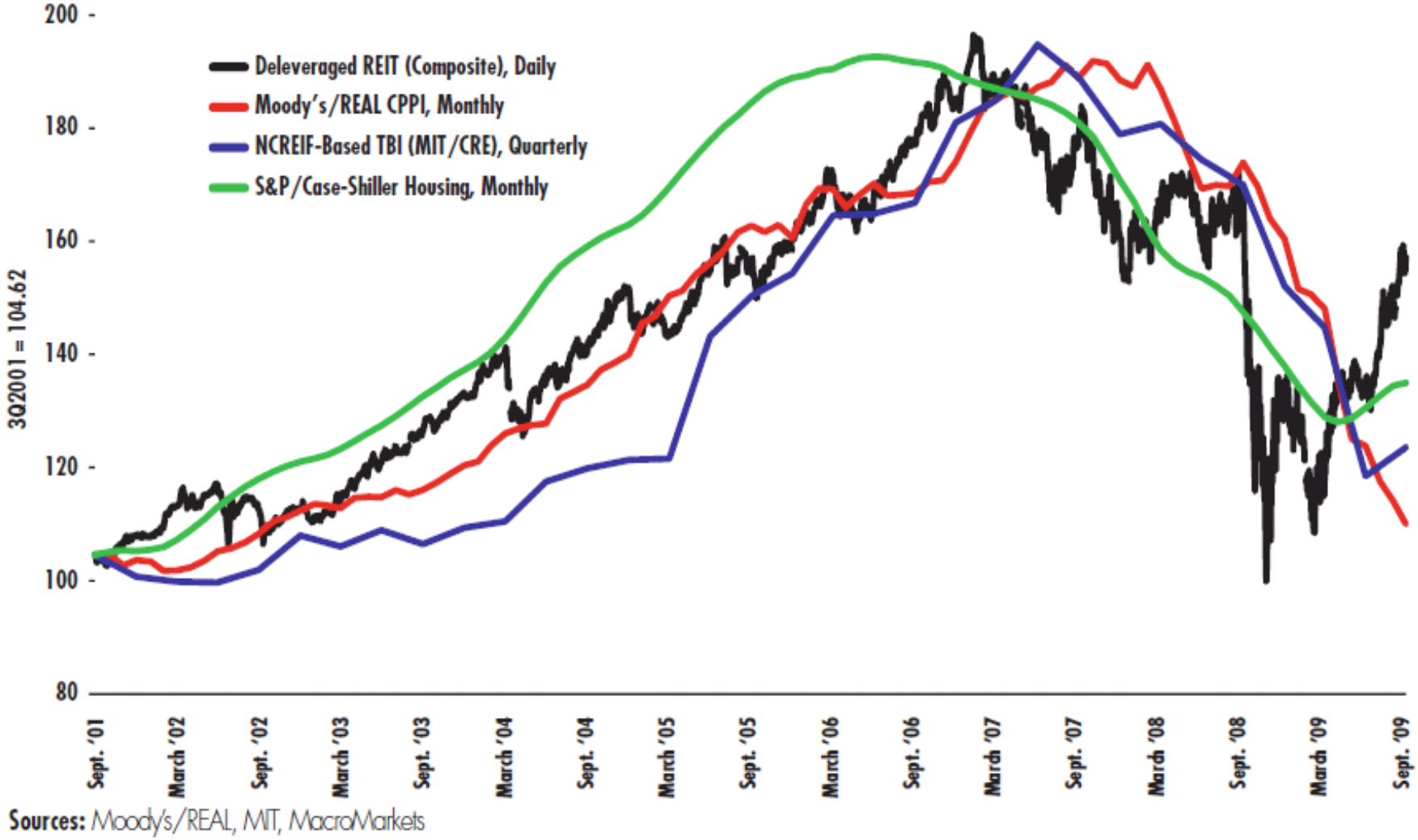
Housing Market's Correlation with Commercial Real Estate

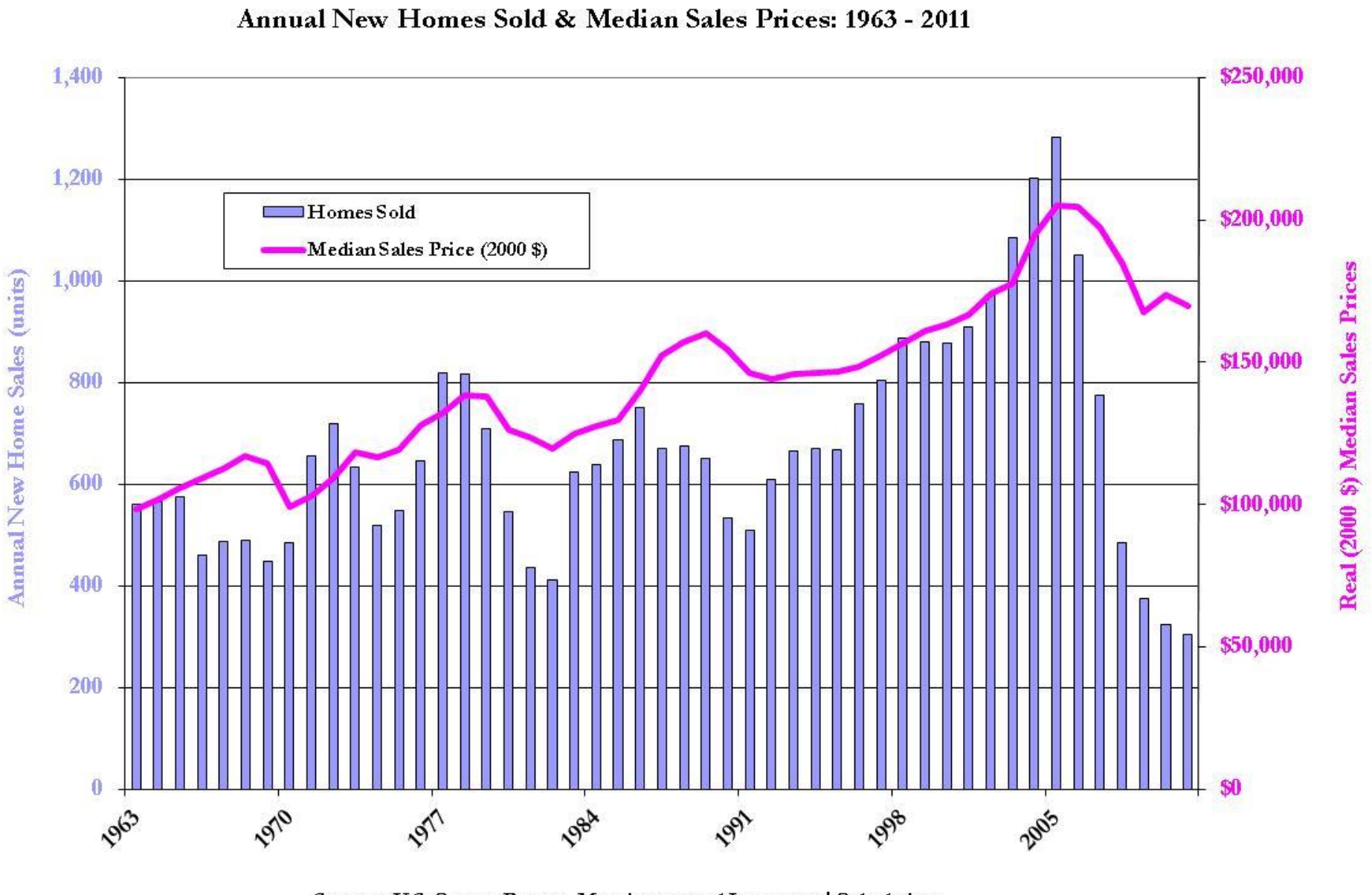
- Residential market slightly led the downturn in the commercial real estate markets
- Most commercial real indices showed a similar correction



Sources: Moody's/REAL, MIT, MacroMarkets

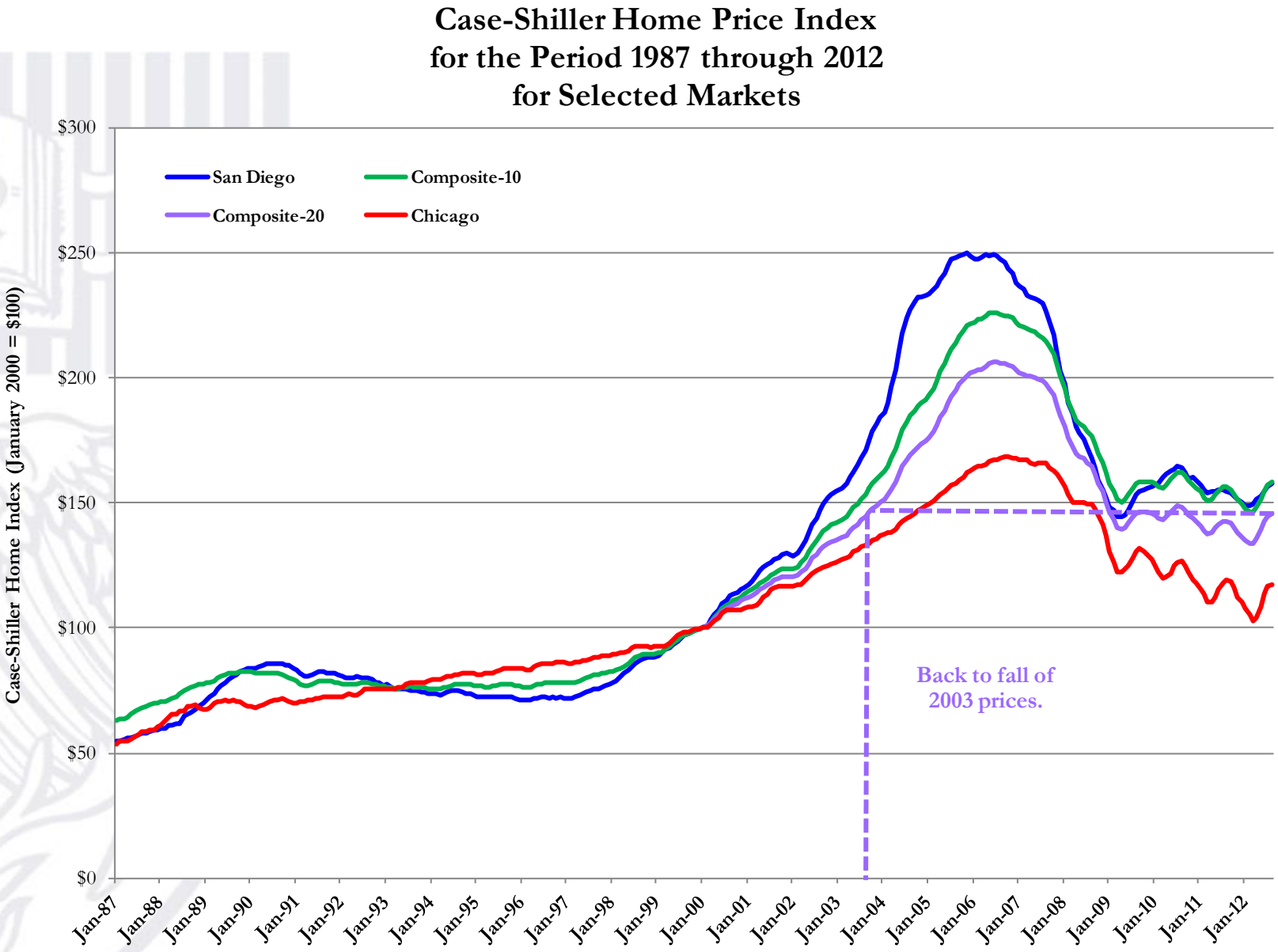
See: "The US Property Market in 2010," David Geltner, *PREA Quarterly*, Winter 2010.

Residential Real Estate Still in the Doldrums



Sources: U.S. Census Bureau, Morningstar and Instructors' Calculations

Home Prices | Approaching a "Lost Decade"

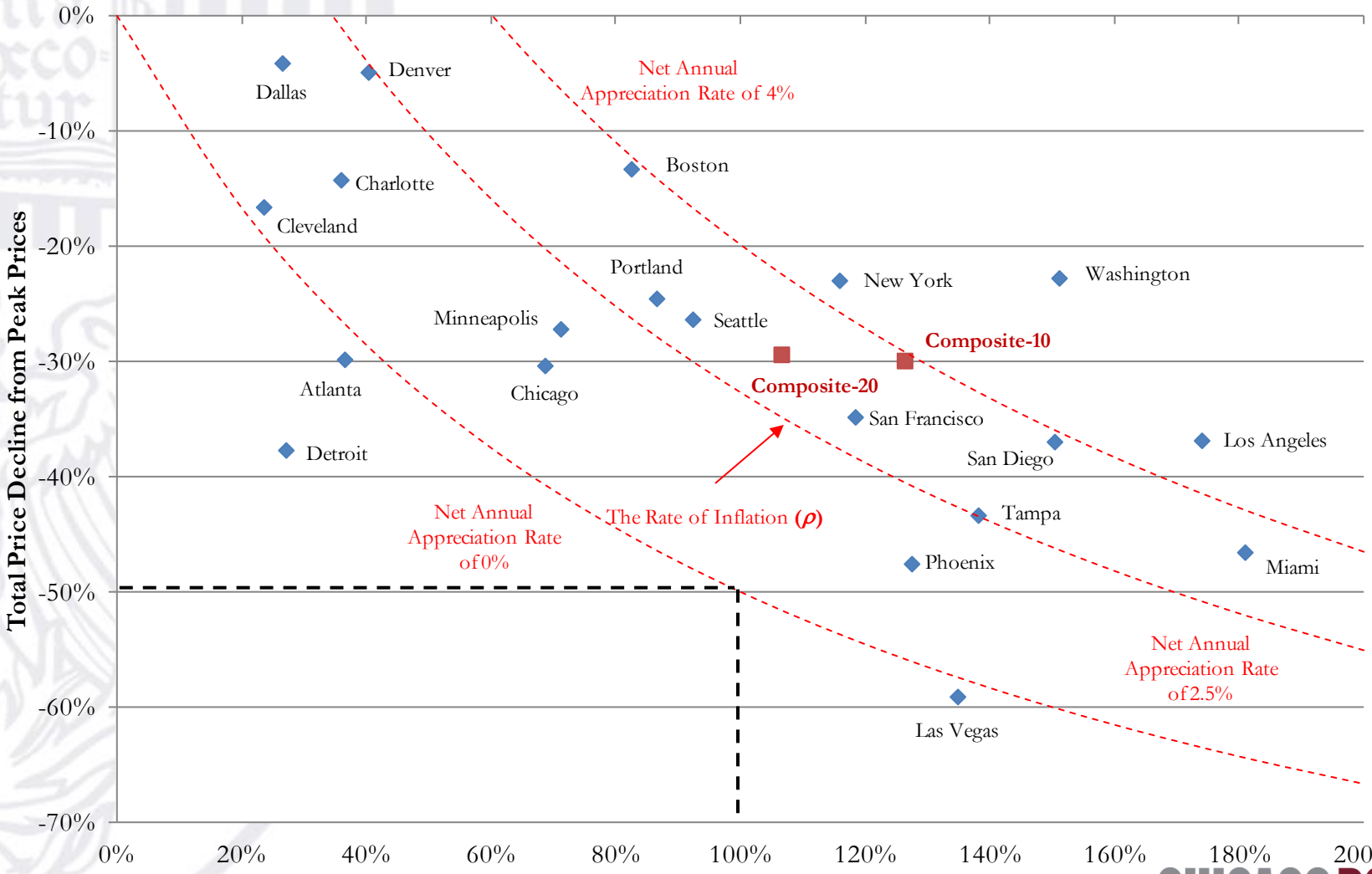


Source: S&P Case Schiller Index

Residential Real Estate Is Highly Localized

In addition to the average appreciation rate, volatility matters.

"Bubble" Growth and Subsequent Decline for Certain US Housing Markets: 2000 through 2012



Bubble Growth: Maximum Price Increase from January 2000

Source: S&P Case Schiller Index and instructor's Calculations

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Can We Have an Economic Recovery without a Housing Recovery?

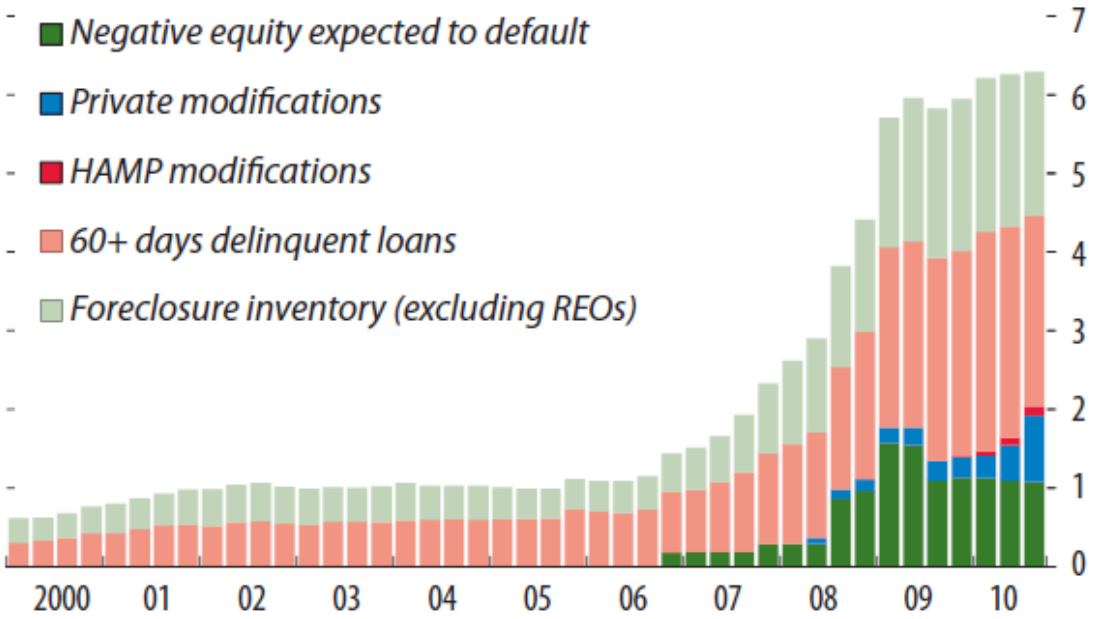
- Consider the depth of the housing market and its impact on:
  - the construction industry:
    - unemployment is disproportionately male and less-educated
  - the banking sector:
    - when will banks start lending again?
  - consumer confidence:
    - if your largest investment is faltering, how confident will you be?
- The administration has already attempted at directly reviving the housing market;
  - however, the positive effects seem to have been little.
- Is there the political will to make another attempt?
  - Should there be?
- Both parties are advocating some reform of the GSEs
  - Likely to hurt any short-term rebound in home prices

The "Shadow" Supply of Housing

- As estimated by the International Monetary Fund:

Figure 1.24. Shadow Inventory of Houses Potentially for Sale

(In millions of loans)

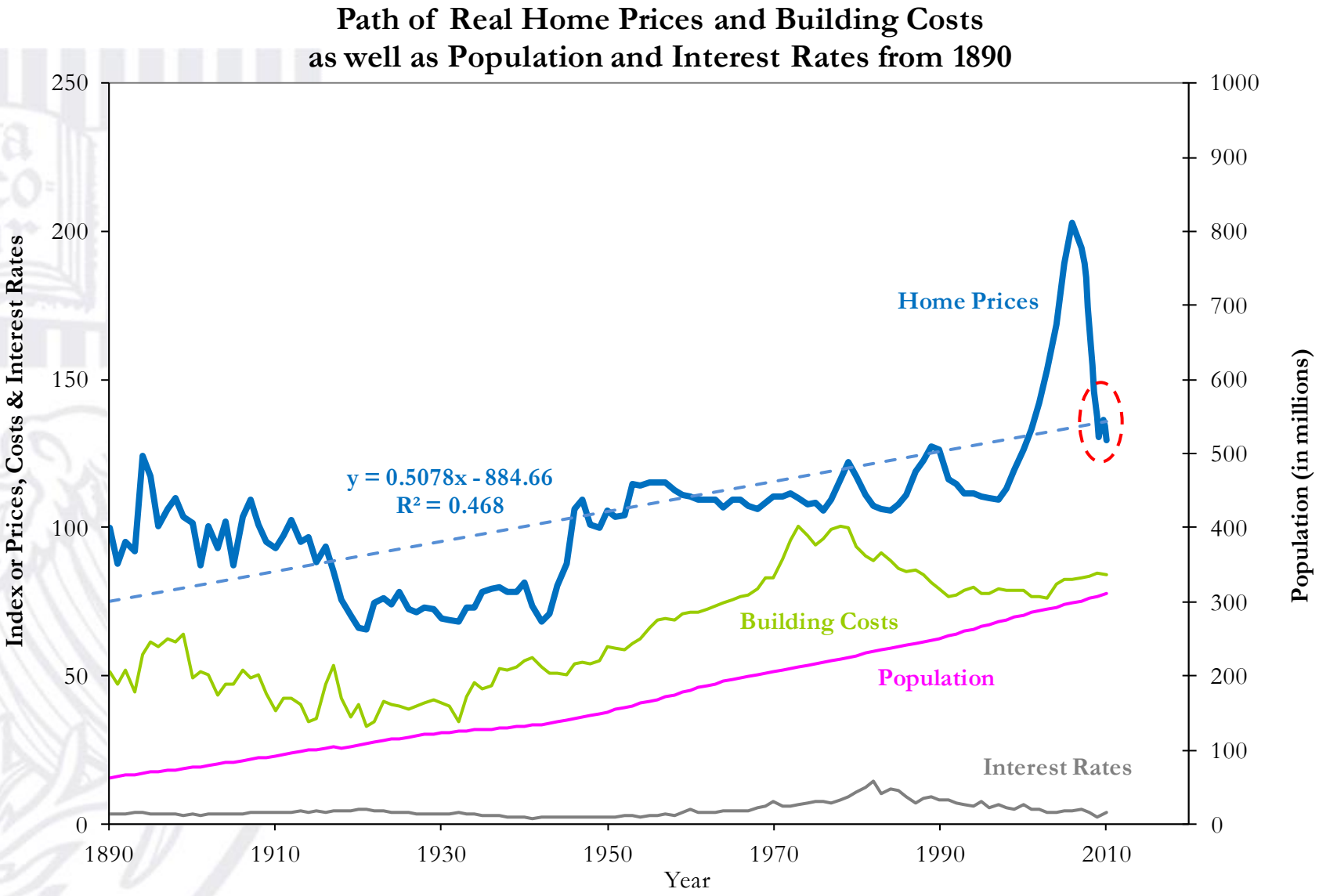


Sources: Mortgage Bankers Association; and IMF staff estimates.
Note: REOs = Real-estate owned. HAMP = Home Affordable Modification Program.

A Rebound in Home Prices?

- An expected recovery in home prices gains momentum:

Path of Real Home Prices | The Long View



Source: Robert Shiller - *Irrational Exuberance* and instructor's calculations.

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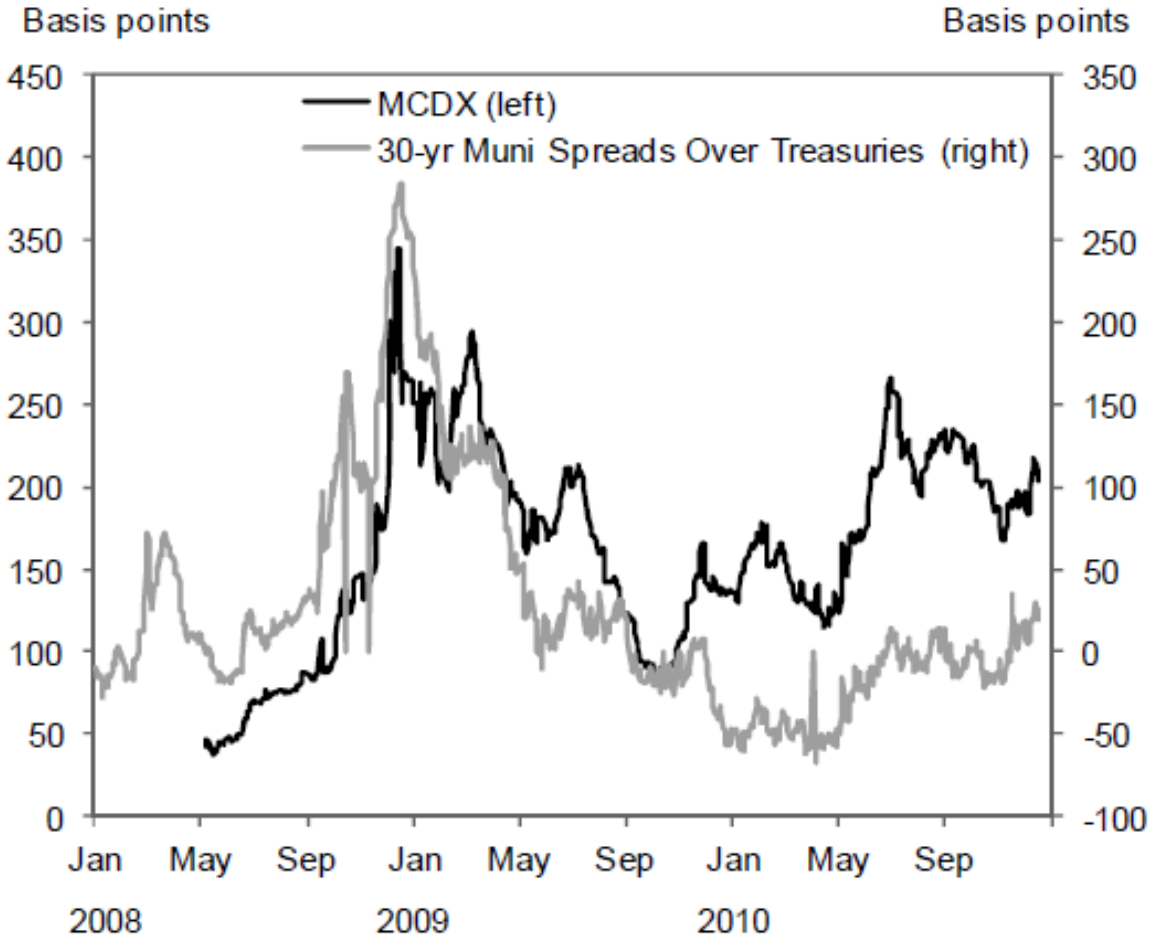
The Financial Strain on State & Local Budgets

- It is no surprise that many state & local budgets are under enormous financial strain. As examples of just two perspectives, consider:
  - Muni bond swap (MCDX) rates, and
  - Muni bond spreads over Treasuries

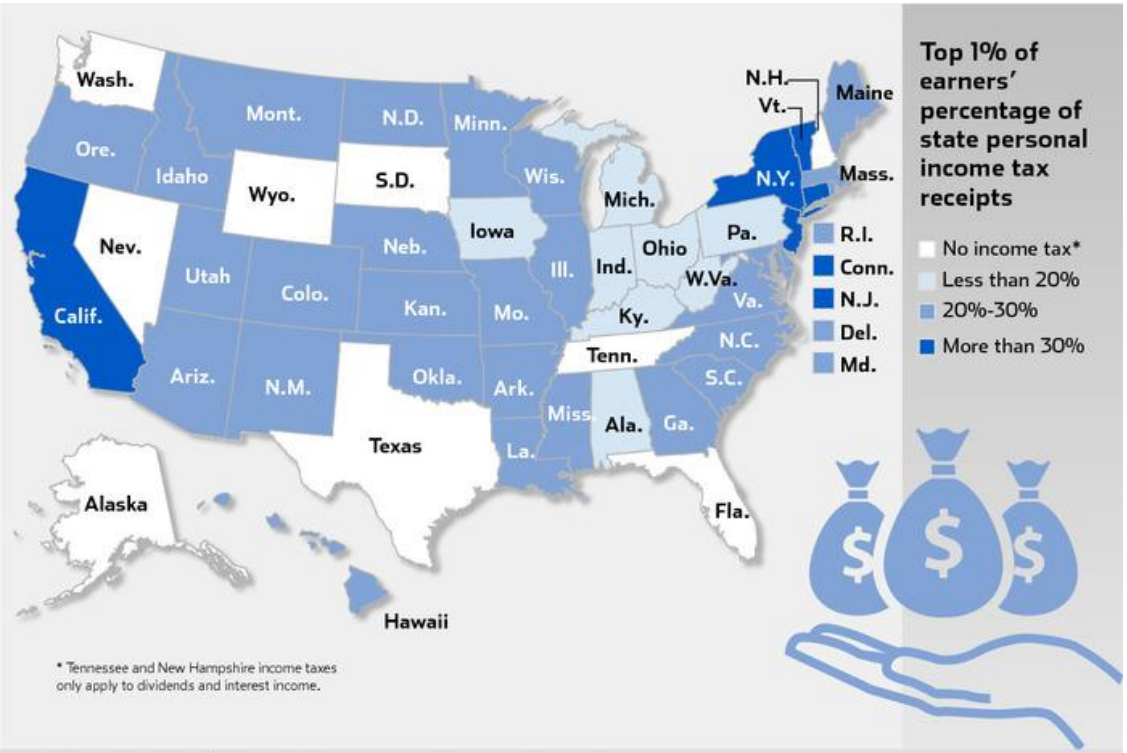


Sources: Markit, Goldman Sachs.

The Residential Real Estate Channel

- **The fall in home prices contributes to the current strain on state and local budgets.**
  - Fall in home prices contributes to declining consumer confidence
    - Which leads to a decrease in consumer spending
    - Which leads to a decrease in sales taxes
  - Fall in home prices is accompanied by a fall in the volume of home sales
    - Which leads to a decrease in transfer taxes
  - But (*ad valorem*) property taxes are largely a zero-sum game:
    - If everyone's property increases by *x*%, your property tax bill is unchanged.
- **As a result of the foregoing, a due diligence/underwriting item of increasing importance will be the financial condition of state & local entities.**
  - Will be important to:
    - Tenants,
    - Lenders, and
    - Investors.

Increasing Realization: Taxing the Rich Doesn't Work



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

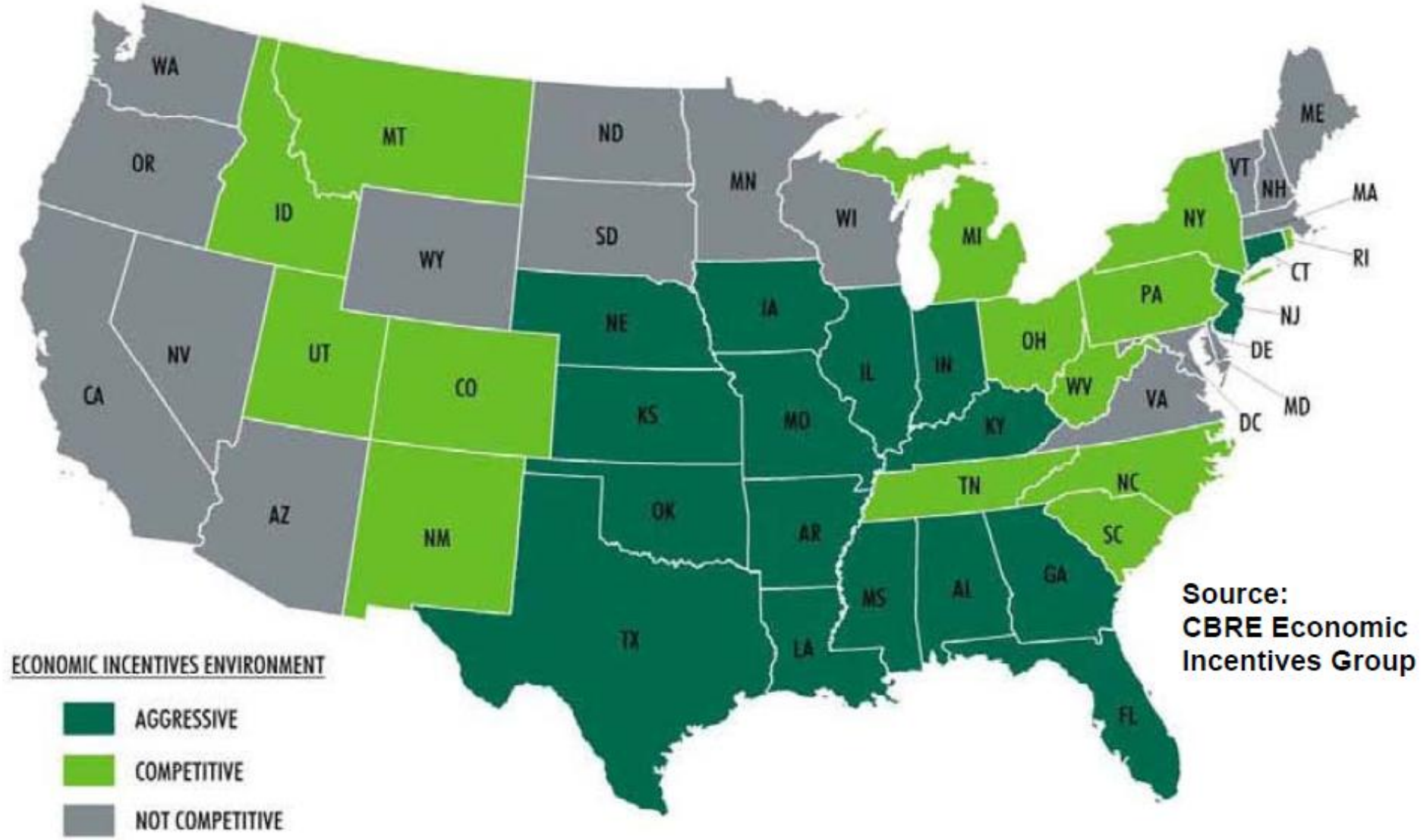
STATE	PERCENTAGE OF STATE REVENUE MADE UP BY INCOME TAXES	HIGHEST INCOME TAX RATE	INCOME LEVEL WHERE IT KICKS IN	PERCENTAGE OF INCOME TAX RECEIPTS PAID BY TOP 1%
California	43.9%	10.3%	$1 million	45%
Connecticut	49.3	6.5	500,001	40
Hawaii	28.4	11.0	200,001	20
Illinois	31.4	5.0	All income	25
Maryland	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.

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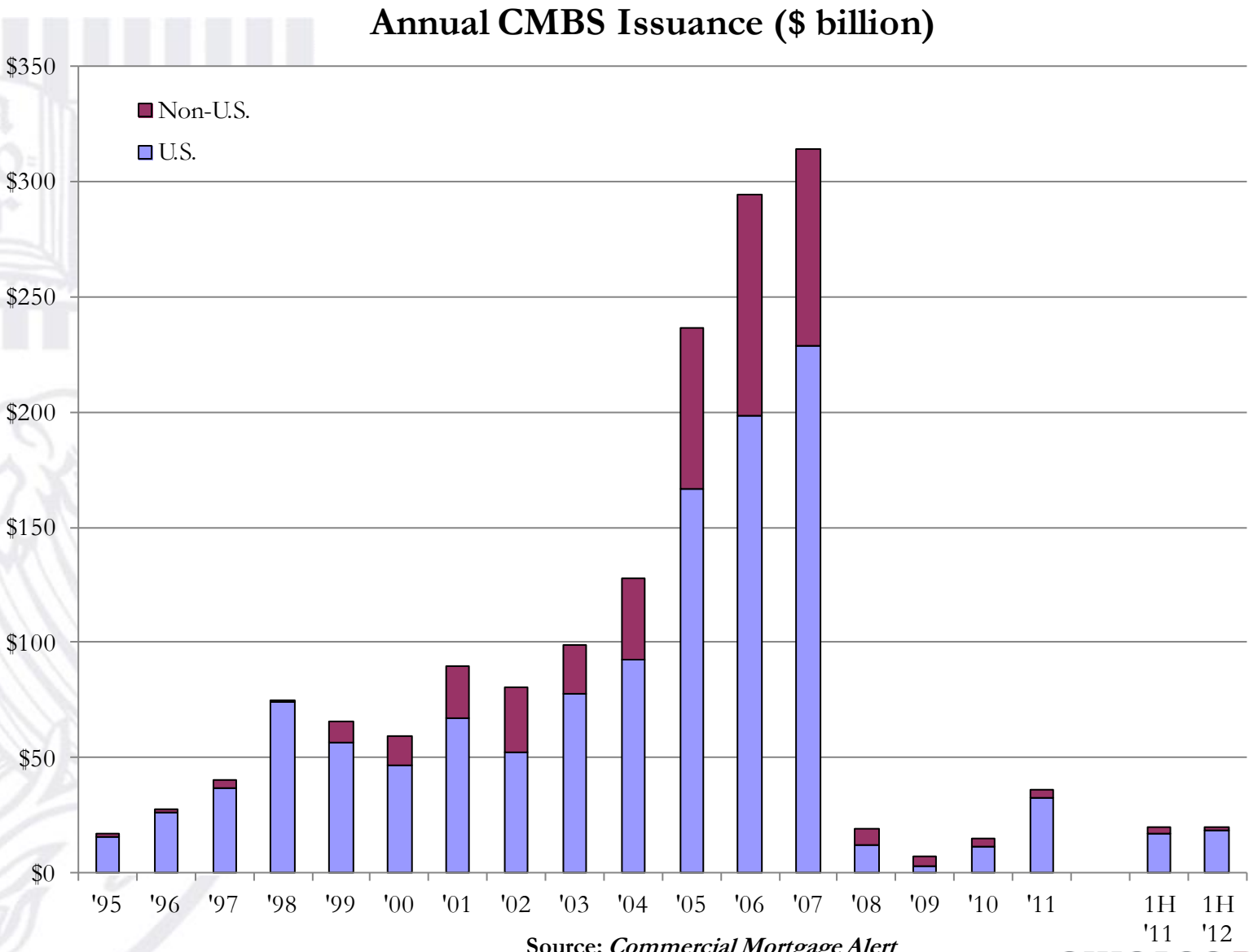
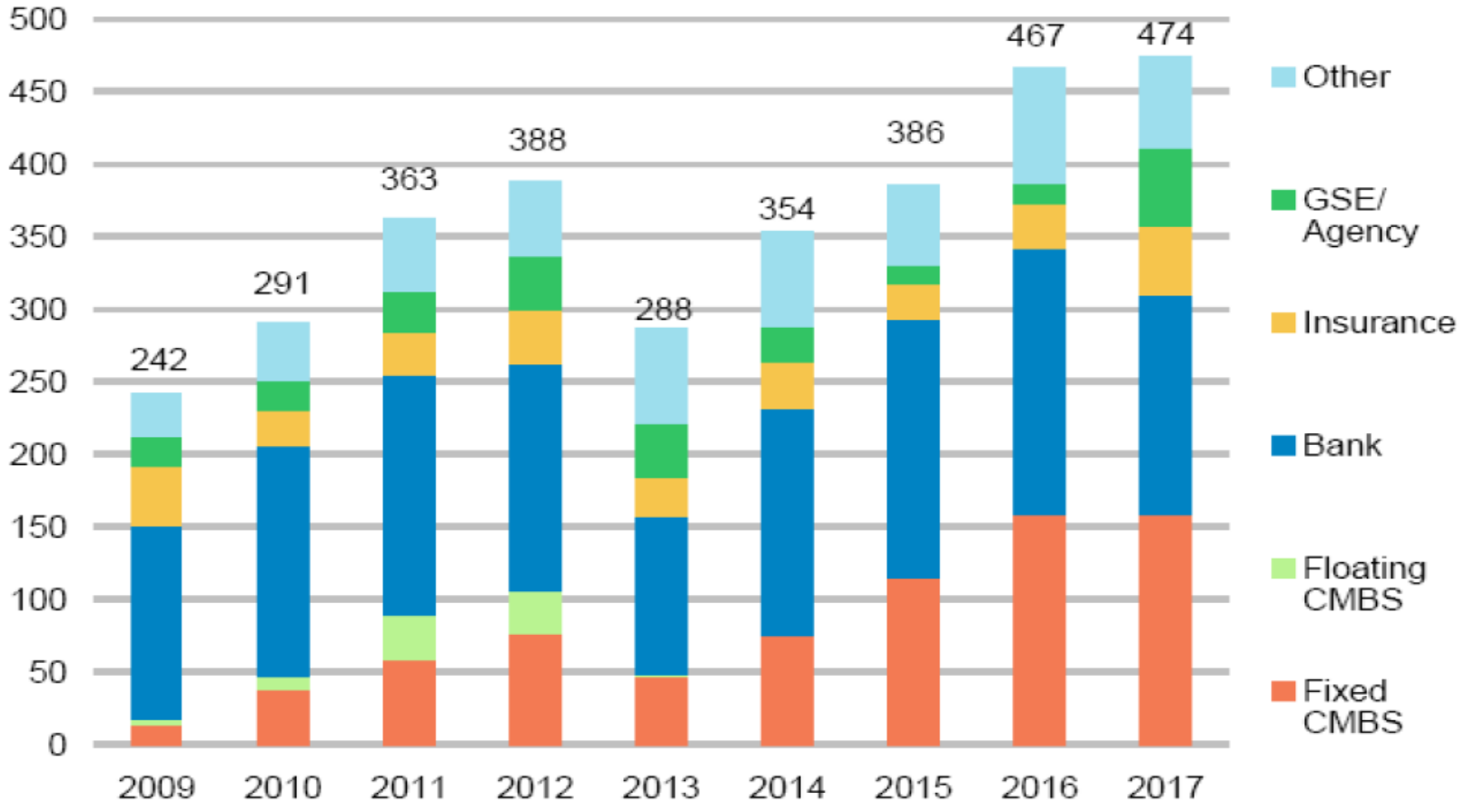
The Collapse of the CMBS Market



Source: *Commercial Mortgage Alert*

A Wave of Refinancings: ~$3.0 trillion Coming Due

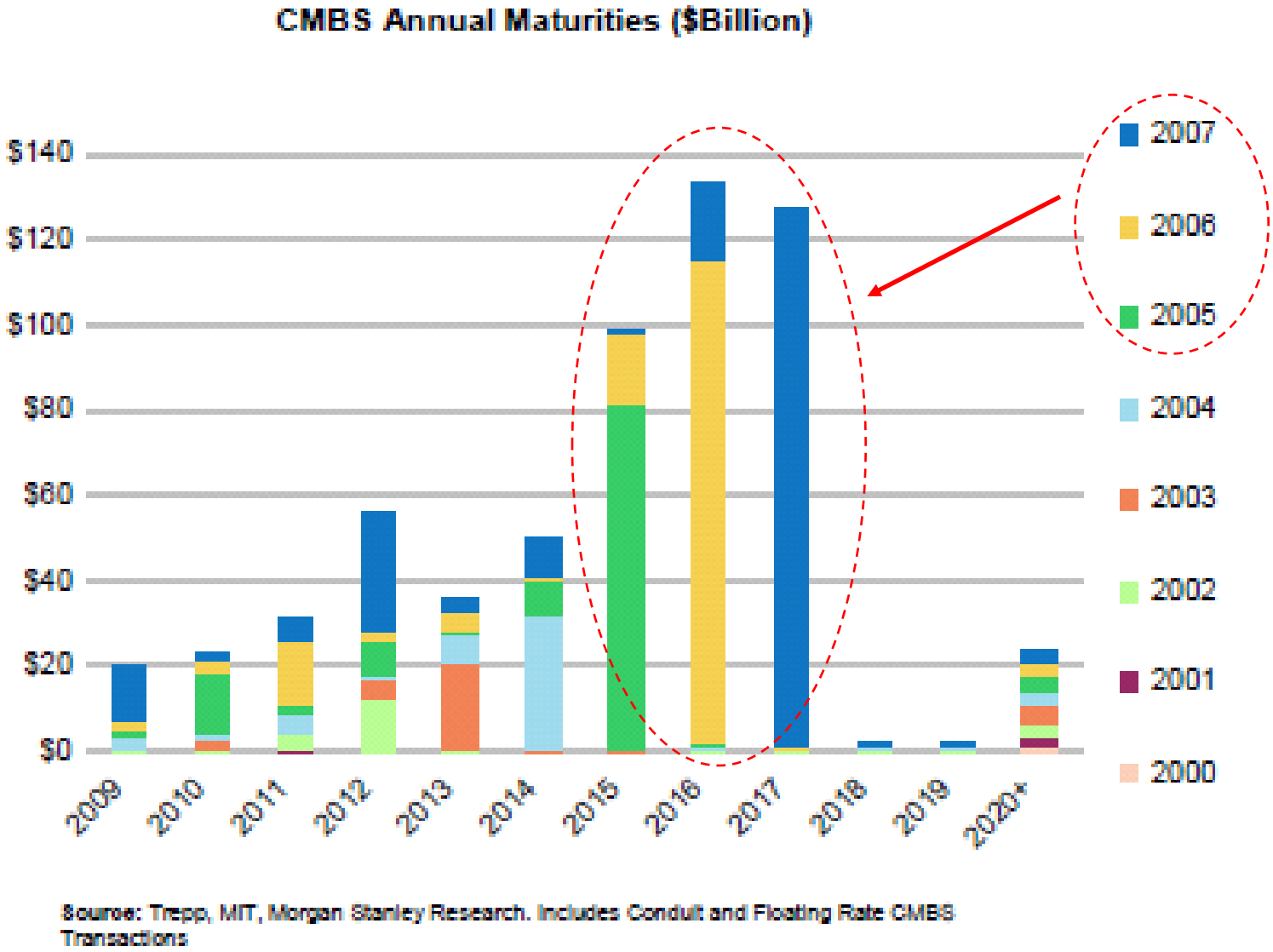
Commercial Mortgage Maturities ($Bn)



Floating-rate CMBS run to maximum extension
Source: Morgan Stanley Research estimates

See: "PPIP: Secondary Becomes Primary," Morgan Stanley Research, March 31, 2009.

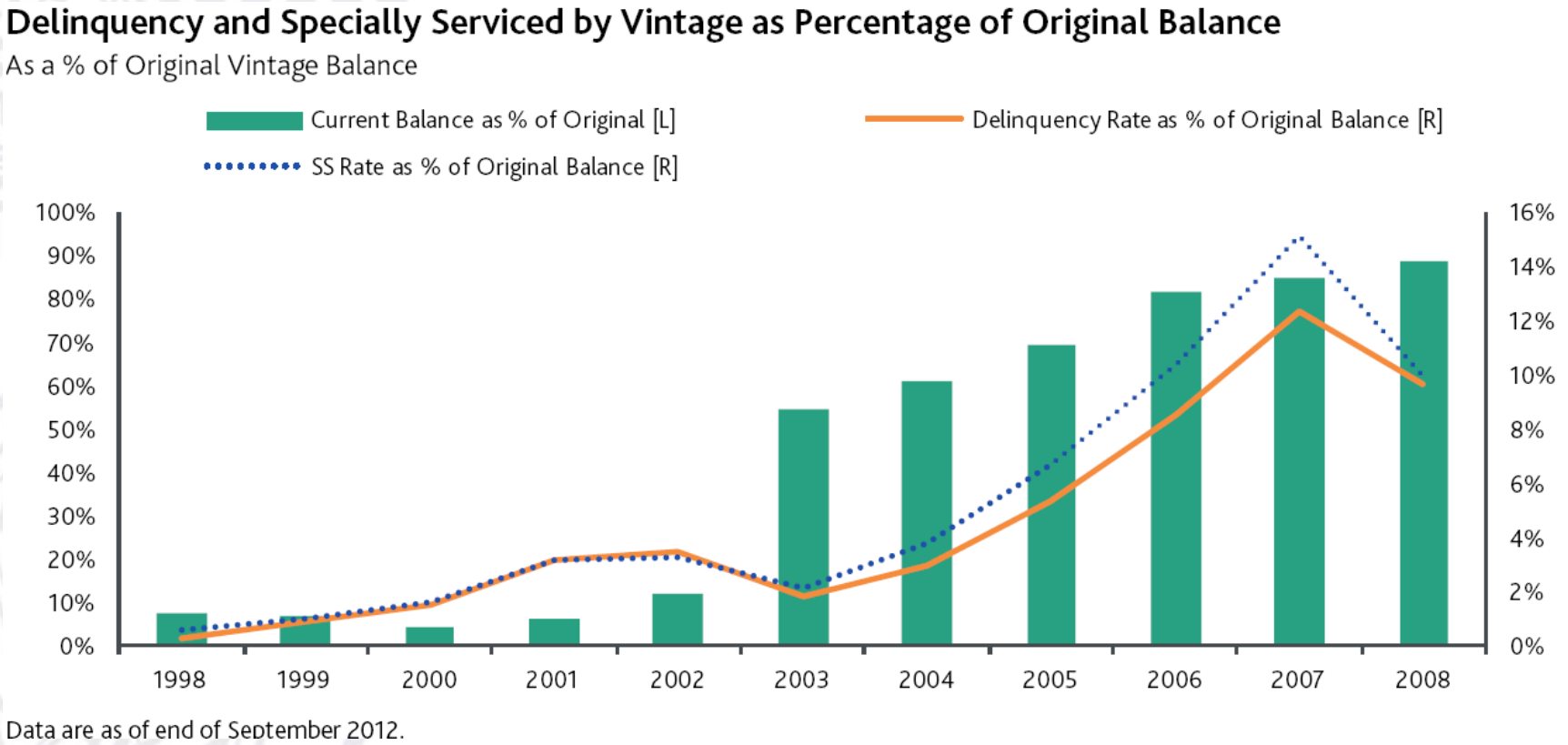
The Aggressive Vintages Coming Due Later



Source: Morgan Stanley Research, "Commercial Real Estate 2010."

CMBS Loan Delinquencies by Vintage

- **Decreasing rate of default for CMBS loans:**



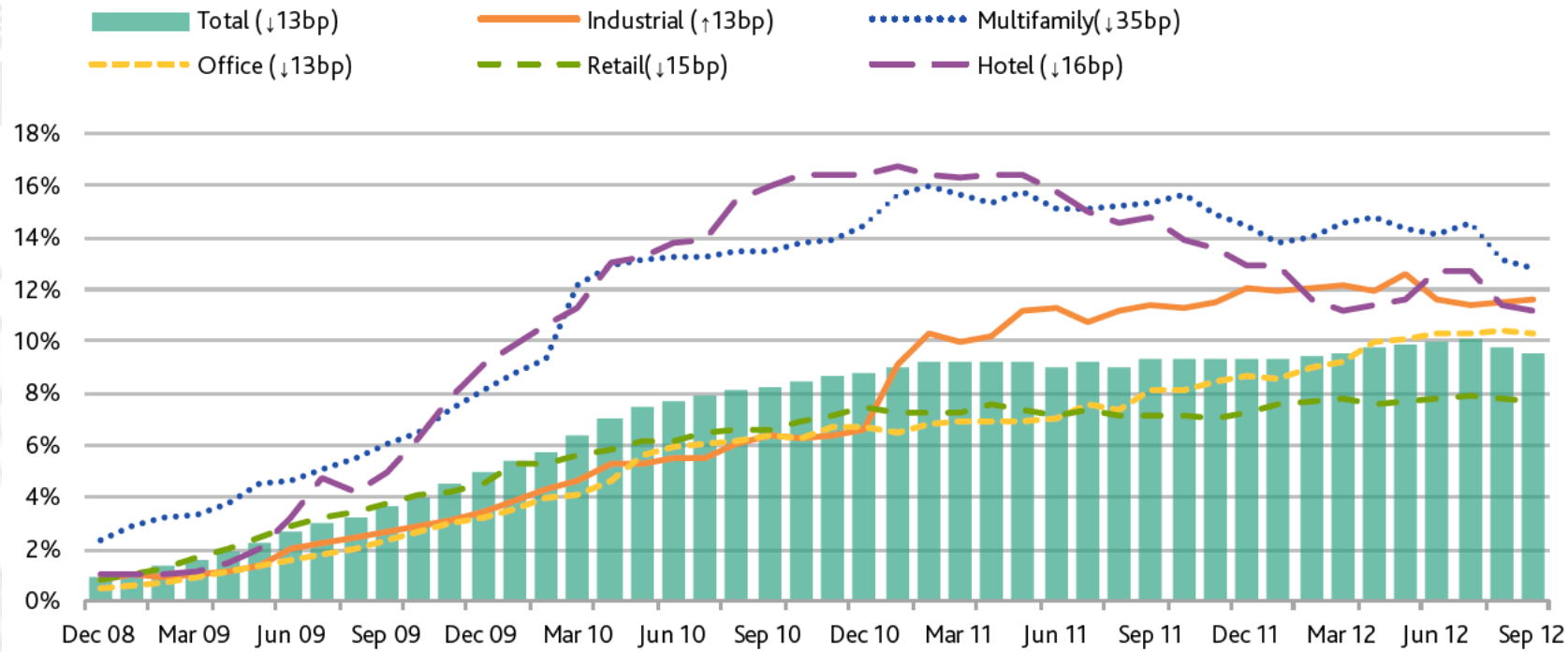
Source: Moody's "U.S. CMBS: Delinquency Tracker," October, 2012

CRE Loan Delinquencies by Property Type

- Increasing rate of default for CMBS loans.
- Note: default rate for multifamily is much higher for CMBS than GSEs
  - Peter Cooper Village Stuyvesant Town skews the numbers.

Total Delinquencies as a Percentage of Outstanding Balance

Core Property Types



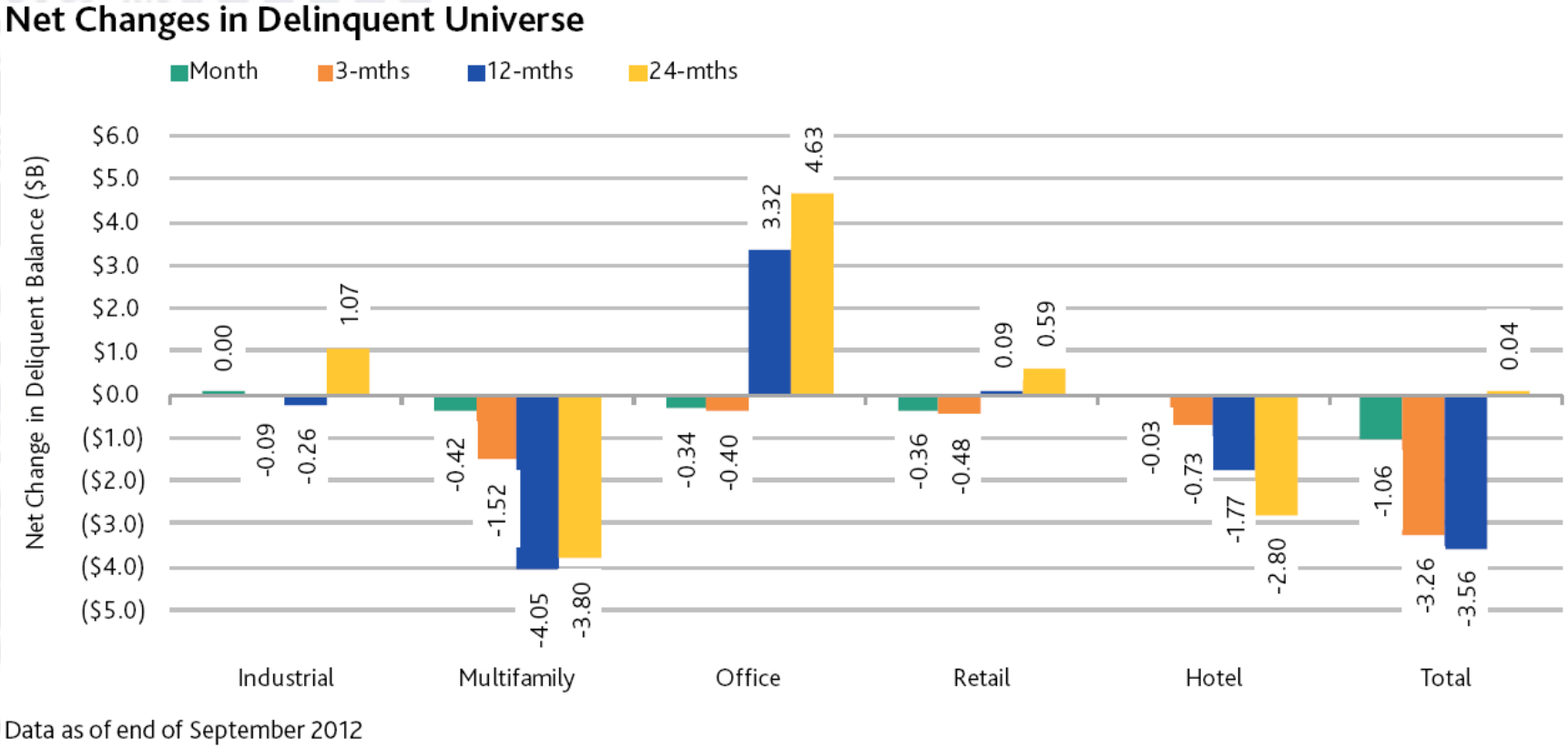
Data as of end of September 2012

Note: "Non-core" properties are all those other than the five core sectors listed and includes, but is not limited to: self storage, healthcare, mobile home, and mixed use properties.

Source: Moody's "U.S. CMBS: Delinquency Tracker," October, 2012

Slowing CRE Loan Delinquencies | Property Type

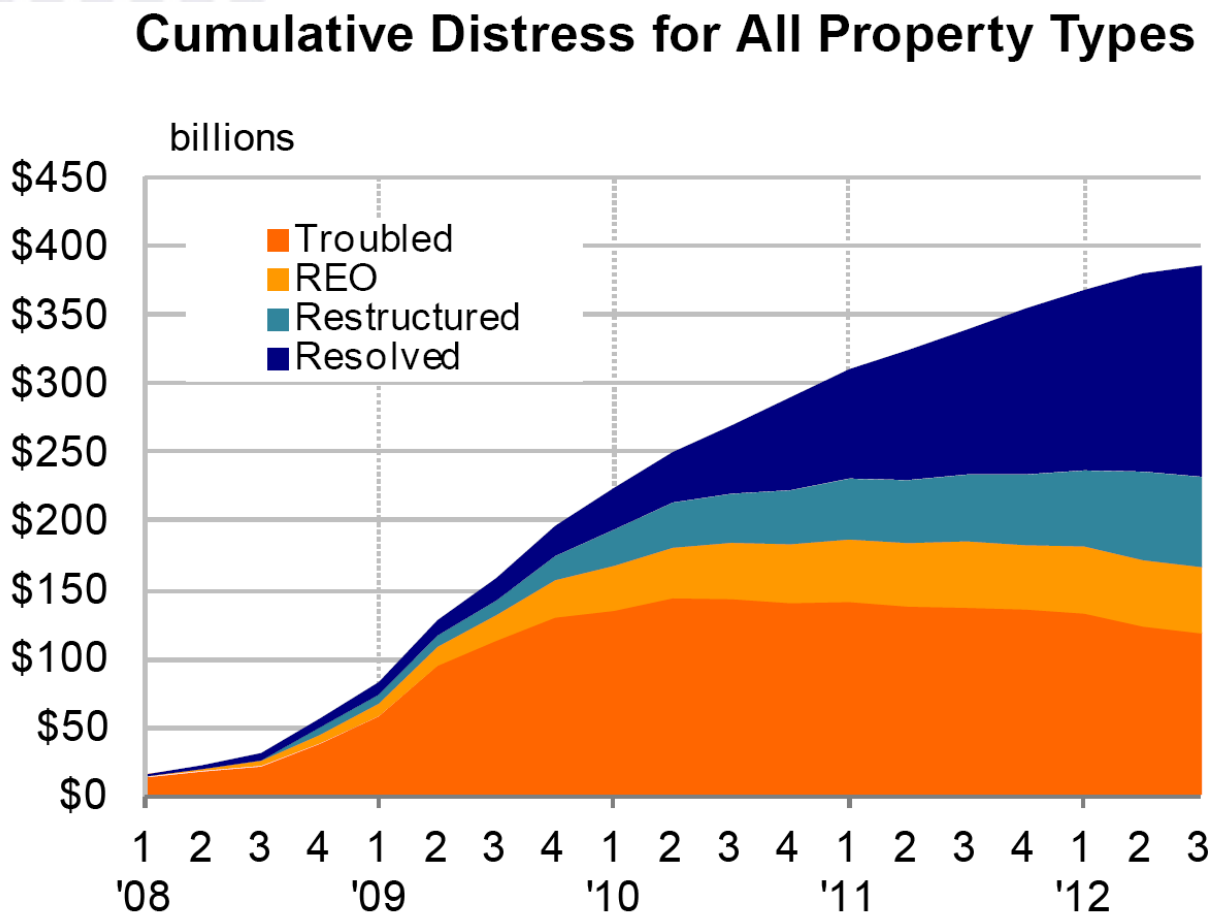
- **Net delinquencies have turned negative for multifamily, retail and hotels:**



Source: Moody's, "U.S. CMBS: Delinquency Tracker," October, 2012.

Delinquencies Lead to Workouts or Foreclosure

- So far, we're at ~ $350 billion of workouts or foreclosures
- About 1/3 have been resolved

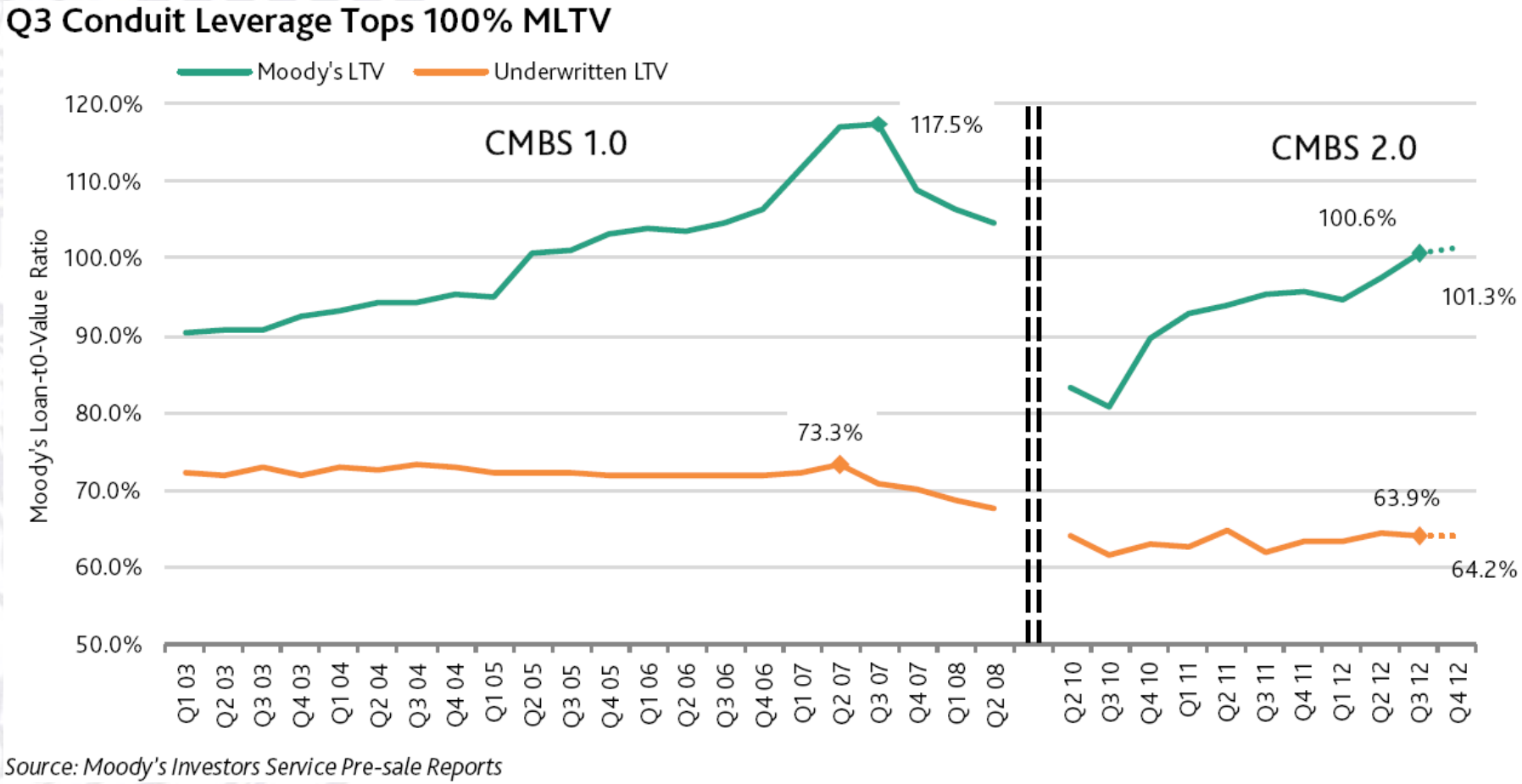


- But, when do these forbearance agreements expire?
- In the midst of the refinancing wave?

Source: Real Capital Analytics, "Quarter in Review, October 2012"

Lessening CMBS Underwriting Standards to the Rescue?

- Another case of "here we go again"?



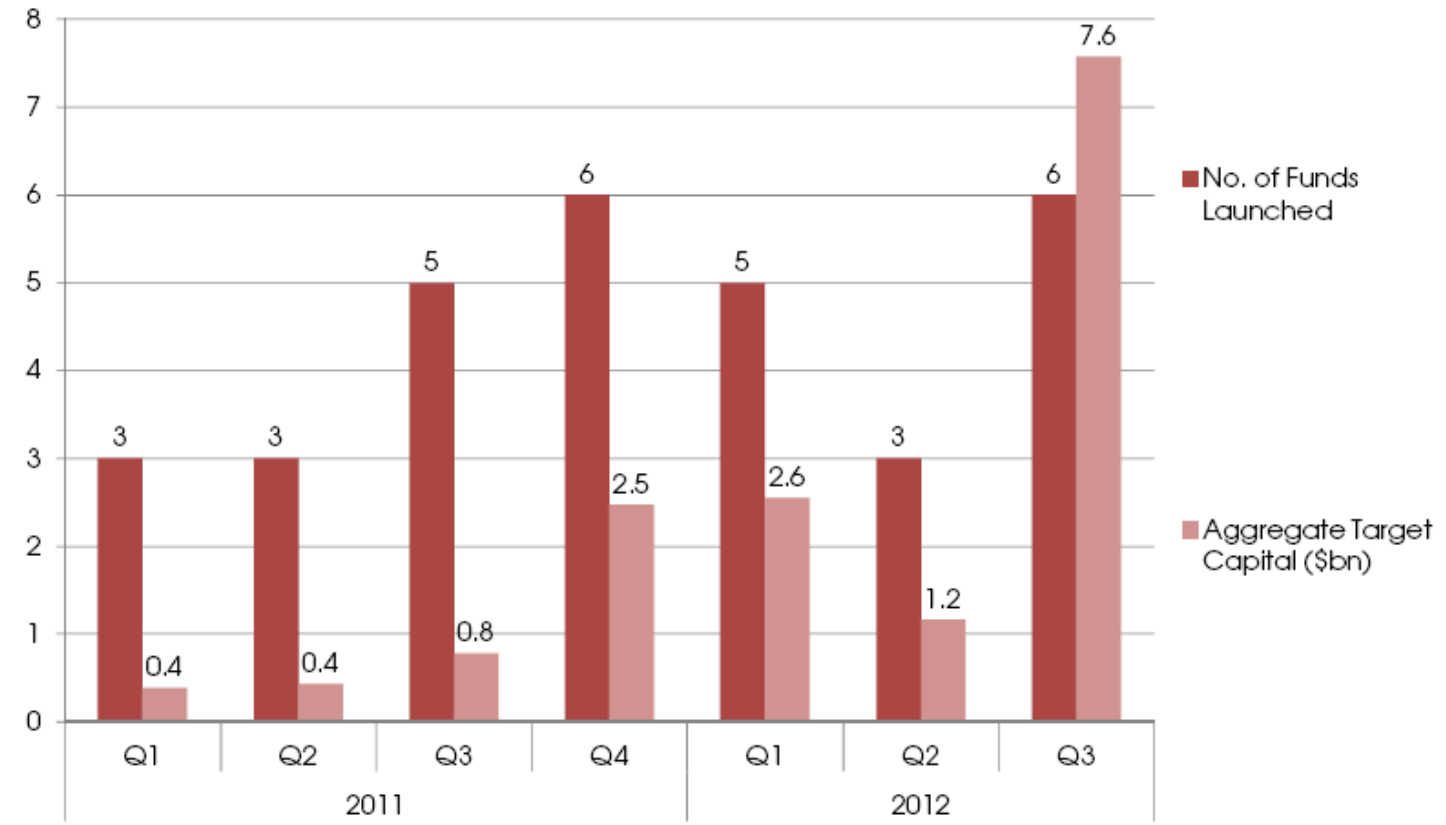
Source: Moody's Investors Service Pre-sale Reports

Source: Moody's, "U.S. CMBS Review," 3rd Quarter 2012.

Real Estate Debt Funds to the Rescue?

- **Is there enough "powder" here? Not yet!**

Fig. 1: Real Estate Debt Funds Launched, Q1 2011 - Q3 2012



Source: Preqin, "The Growth of Real Estate Debt Funds," *Real Estate Spotlight*, November 2012.

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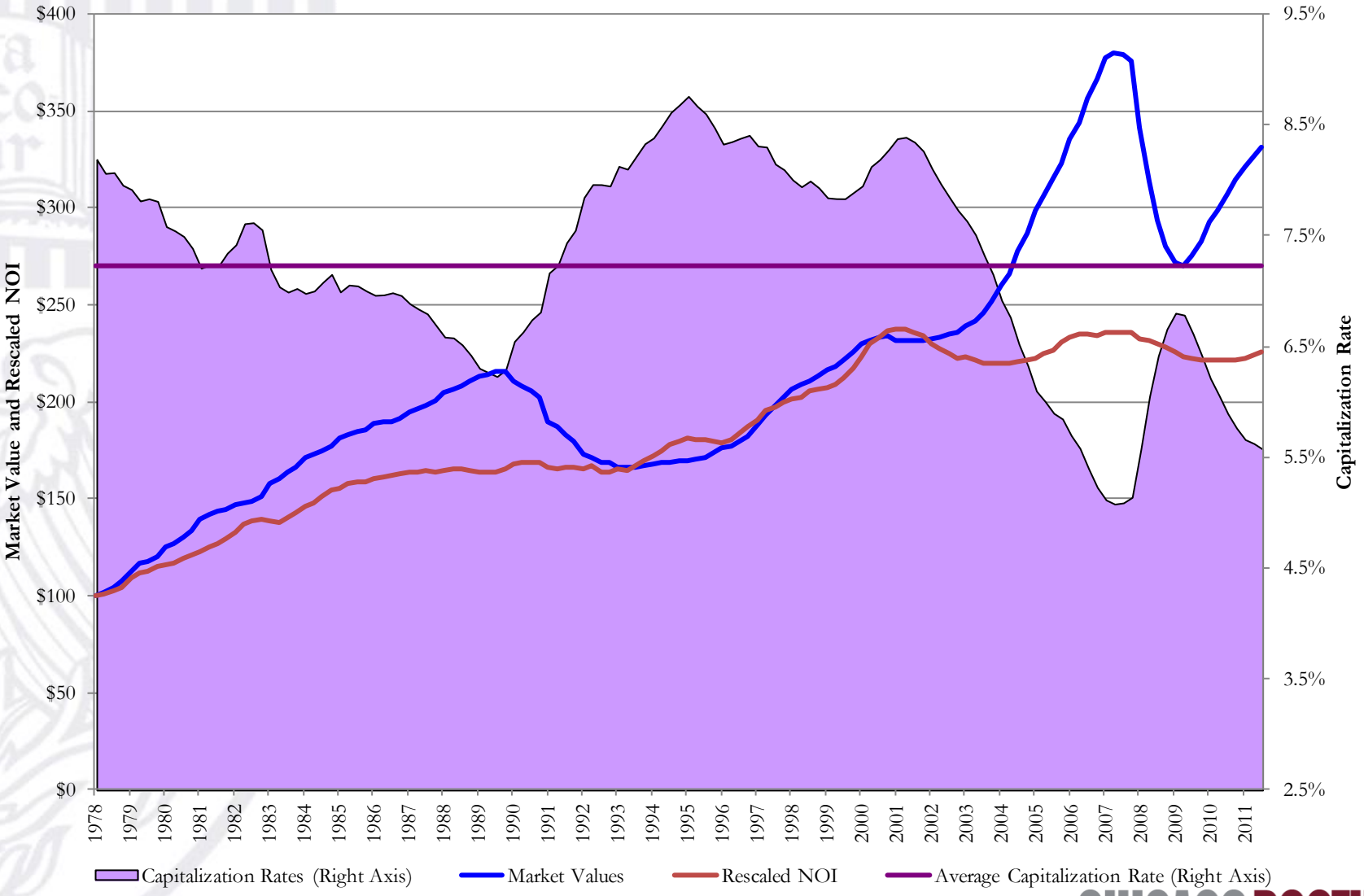
Path of NCREIF Market Values, Incomes & Cap Rates:

NCREIF Property Index: Market Values, Rescaled NOI and Capitalization Rates Based on a $100 Investment for the Period 1978 through 2012



Sources: NCREIF and instructor's calculations.

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Annotated Path of NCREIF Market Values, Incomes & Cap Rates:

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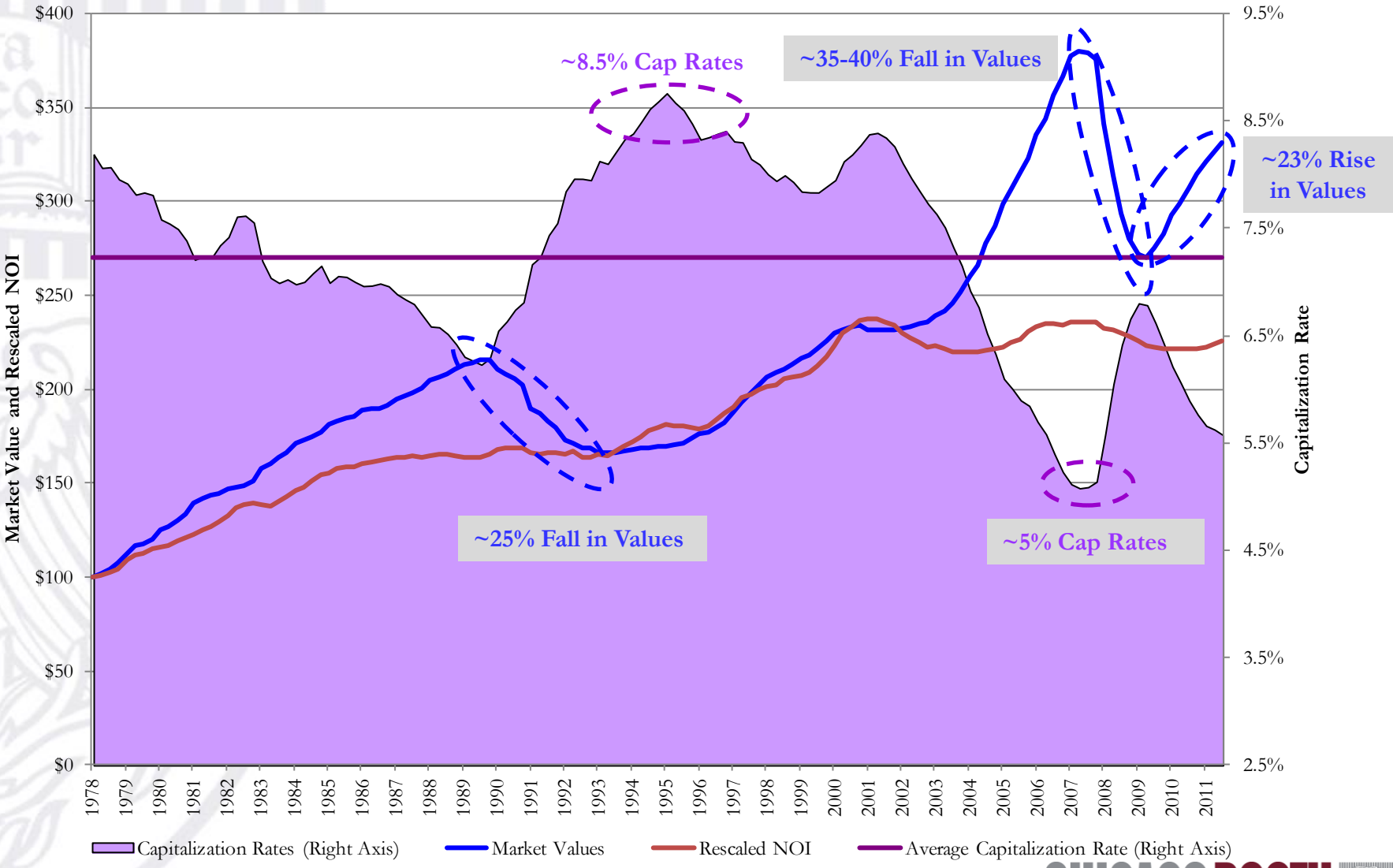
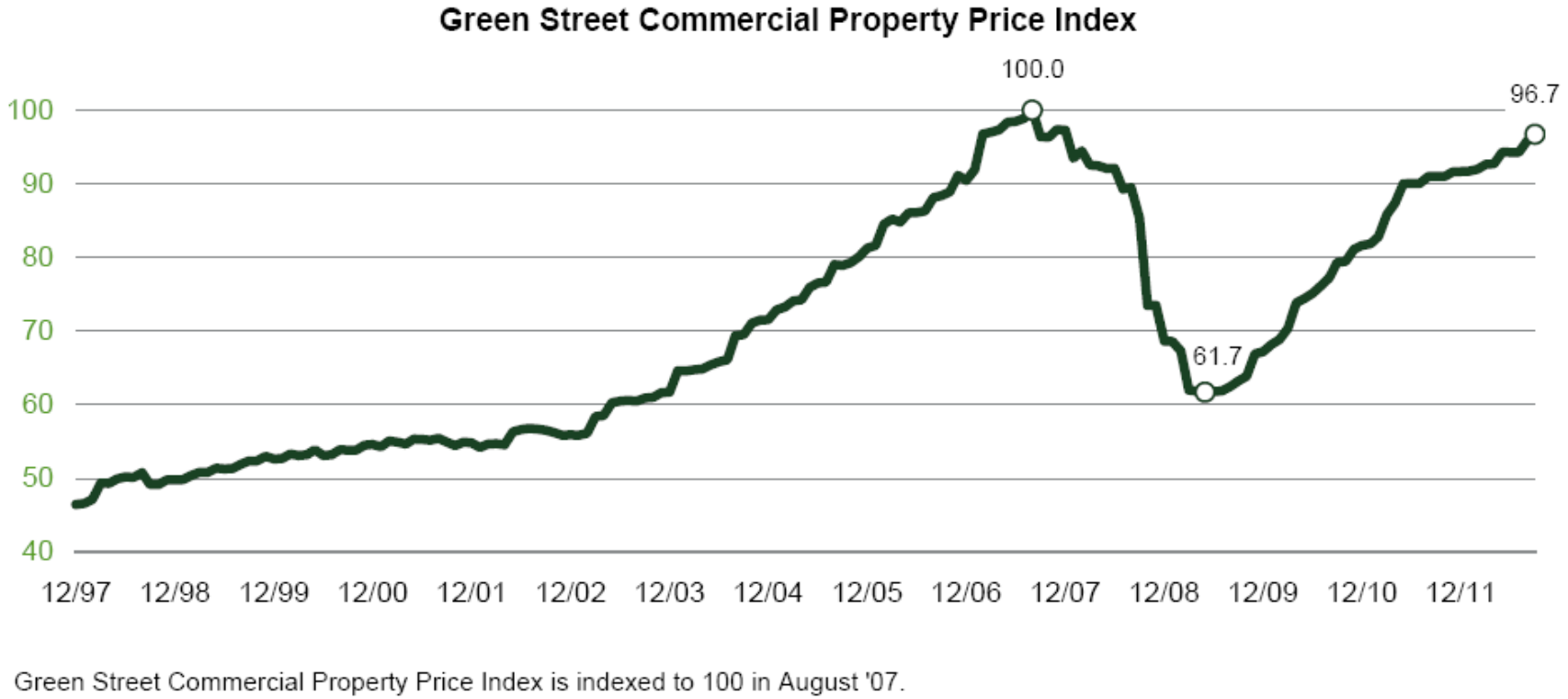


Sources: NCREIF and instructor's calculations.

What About "Real Time" Indices?

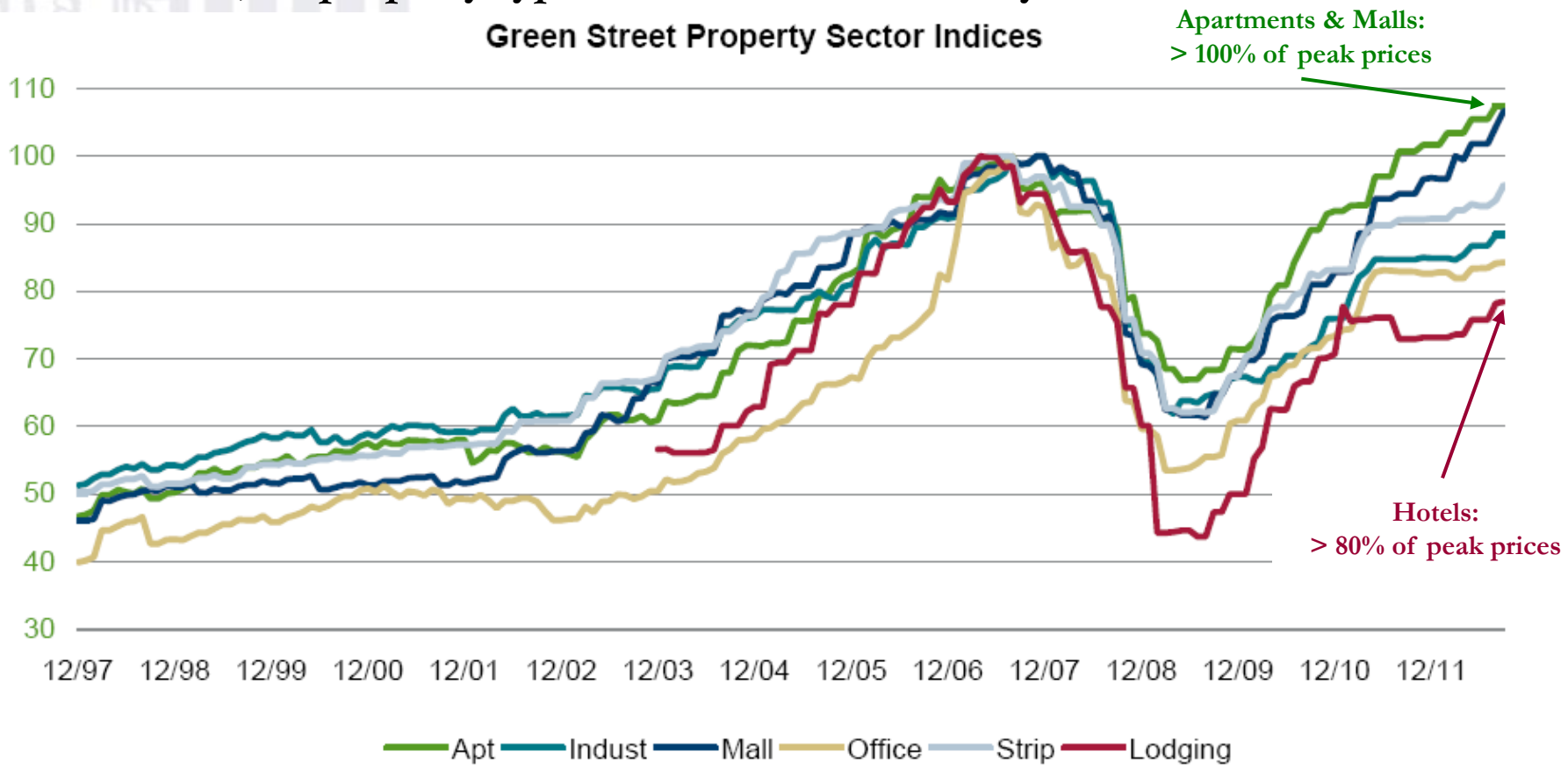
- **The NCREIF Index is appraisal-based.**
- **Other indices show more price recovery, *e.g.*, Green Street:**



Source: Green Street Advisors, *Commercial Property Price Index*, October 4, 2012

What About Differences by Property Types?

- Not surprisingly, apartments have recovered most (and hotels the least).
- However, all property types show similar recovery:

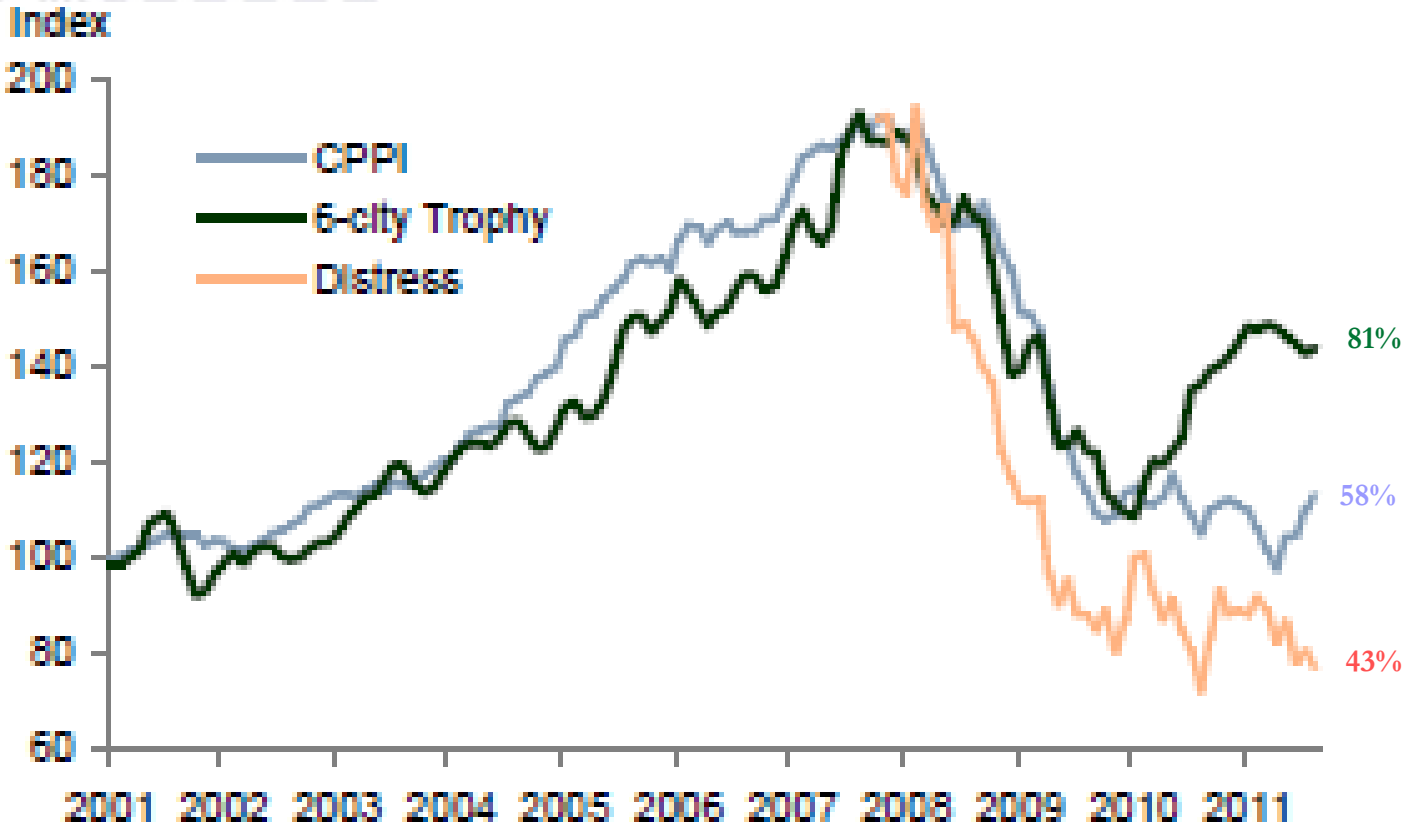


Property sector indices are indexed to 100 at their respective peaks.

Source: Green Street Advisors, *Commercial Property Price Index*, October 4, 2012

Averages Can Be Misleading

- Said another way: significant differences by quality



Sources: Real Capital Analytics and Geltner Associates.
* CPPI Trophy => $10M, Non-Troubled, 6-City = NY, DC, SF, LA, Chicago & Boston

Components of Return: Fundamental Relationships

- In principle, the foregoing risks can be priced
- RECALL: 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):

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

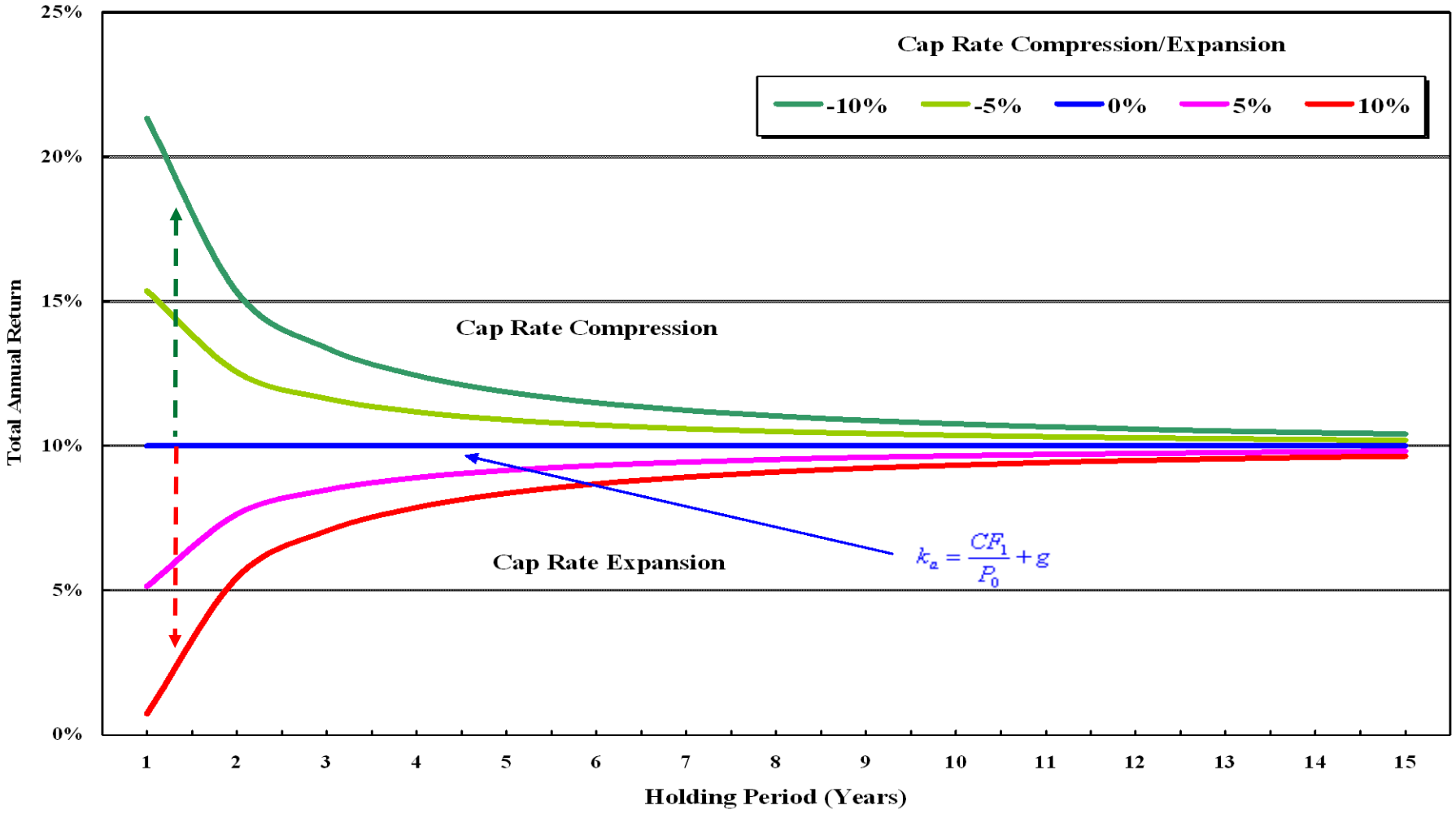
- In the short run, asset-level returns can be heavily influenced by the effects of shifting capitalization rates (∇) :

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

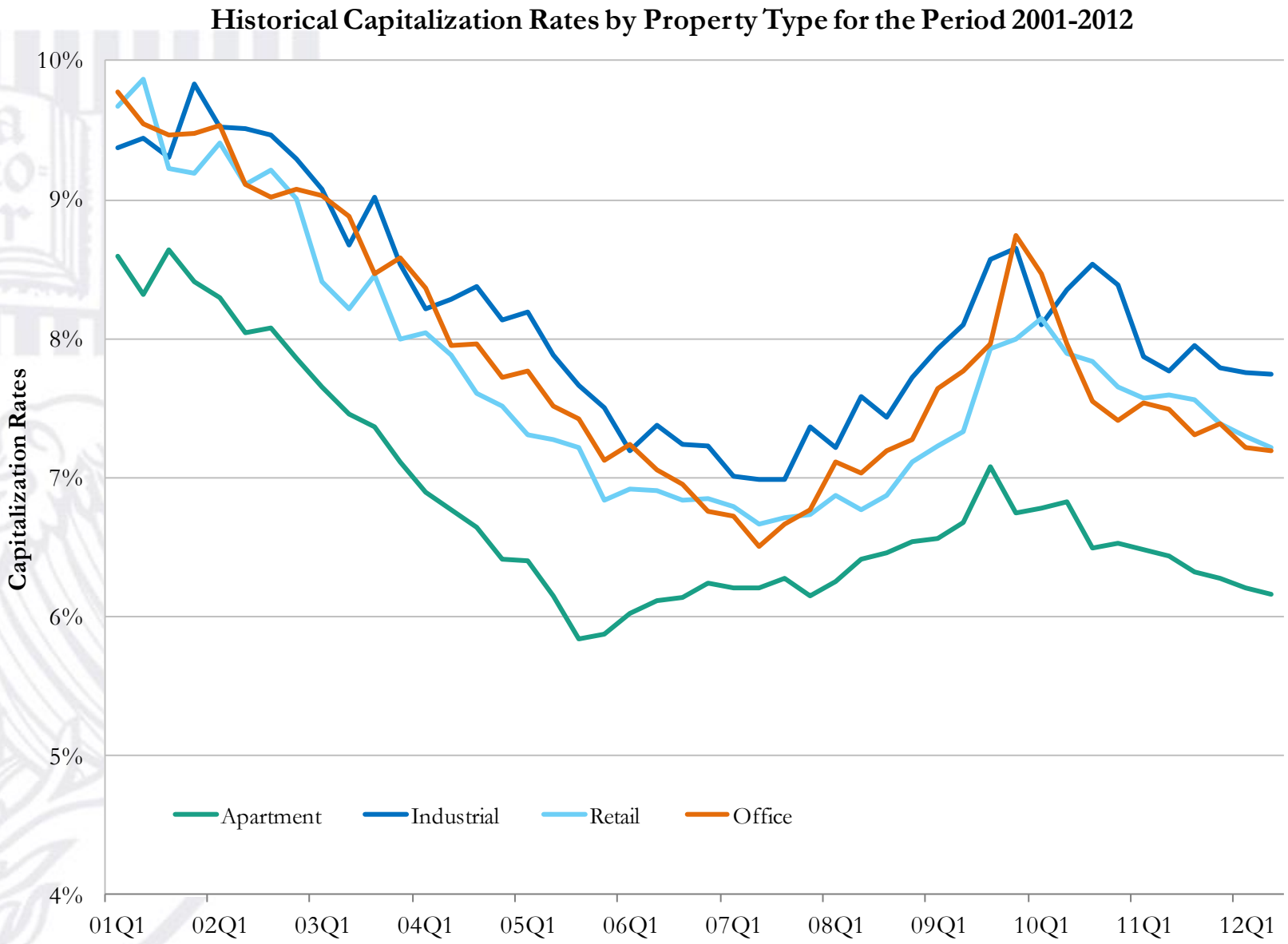
  - ∇ : More easily seen in the following graph.

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

Components of Return: Holding Period & Cap Rates



An Overview of Capitalization Rates



Source: Real Capital Analytics.

Cap Rates → Cash-Flow Yields

- **Significant ambiguities surrounding cap rates.**
- **Apartments have a very different "cap ex" behavior:**

An Illustration:
Conversion of Cap Rates to Cash Flow Yield

Property Type	Estimated Capitalization Rate [1]	Estimated Dividend Pay-Out Rate [2][3]	Estimated Cash Flow Rate [4]
Apartments	6.25%	82.5%	5.15%
Industrial	7.13%	66.0%	4.70%
Office	7.25%	61.8%	4.48%
Retail	7.13%	75.0%	5.35%
All	**6.77%**	**70.4%**	**4.77%**

(1) Source: Real Capital Analytics Quarter in Review, Oct 2012.

(2) Represents typical portion of NOI converted to cash flow. The difference represents "cap ex" (*i.e.*, tenant improvements, leasing commissions and capital improvements.

(3) Source: NCREIF and author's calculations.

(4) Represents the product of the capitalization rate and the dividend pay-out ratio.

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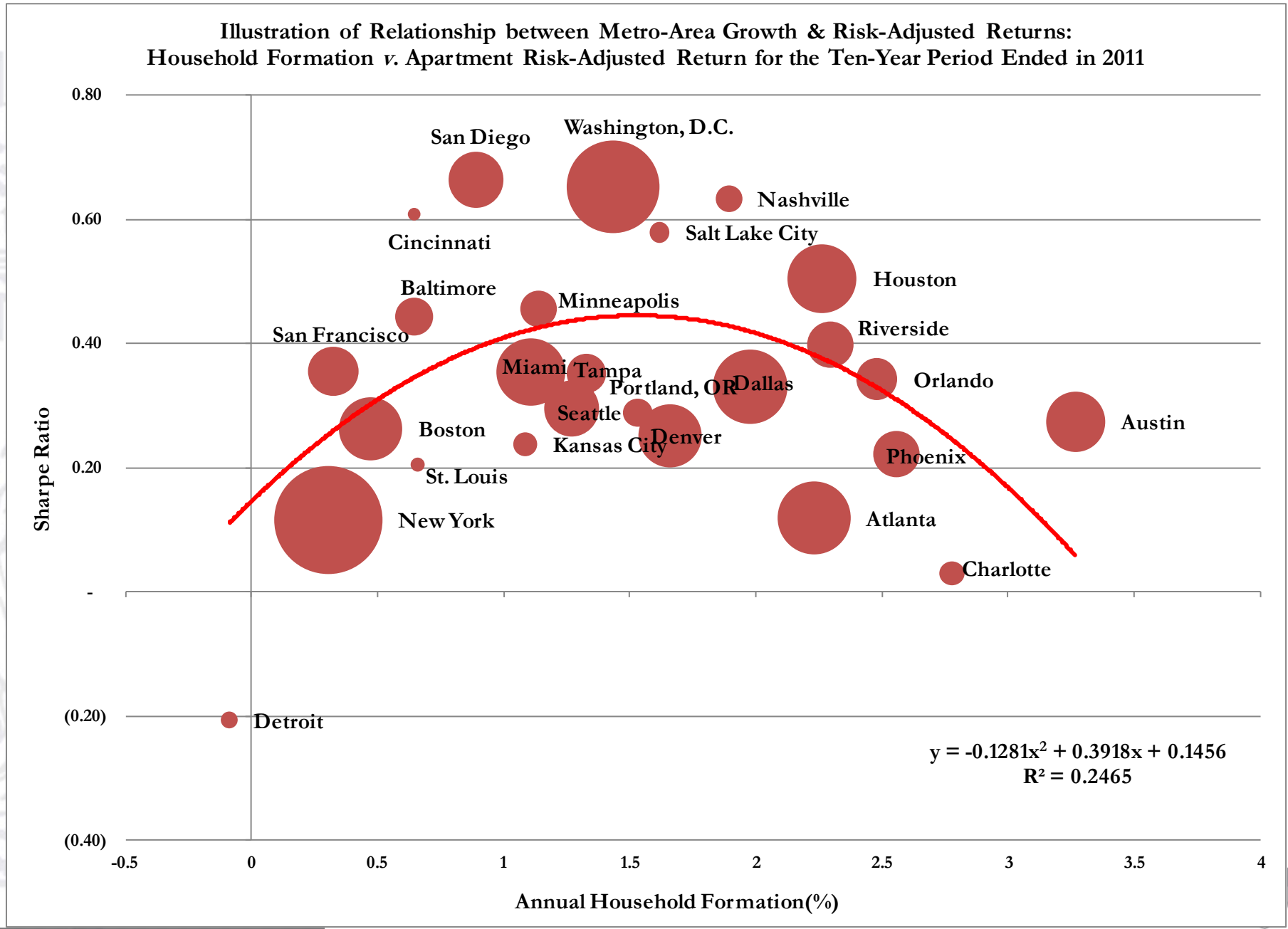
Growth: Too Much of a Good Thing?



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:

$$E[\text{Building Value}_{t+j}] = \$100 \text{ million}$$

$$\sigma_{E[\text{Building Value } t+j]} = \$10 \text{ million}$$

$$E[\text{Building Cost}_{t+j}] = \$90 \text{ million} *$$

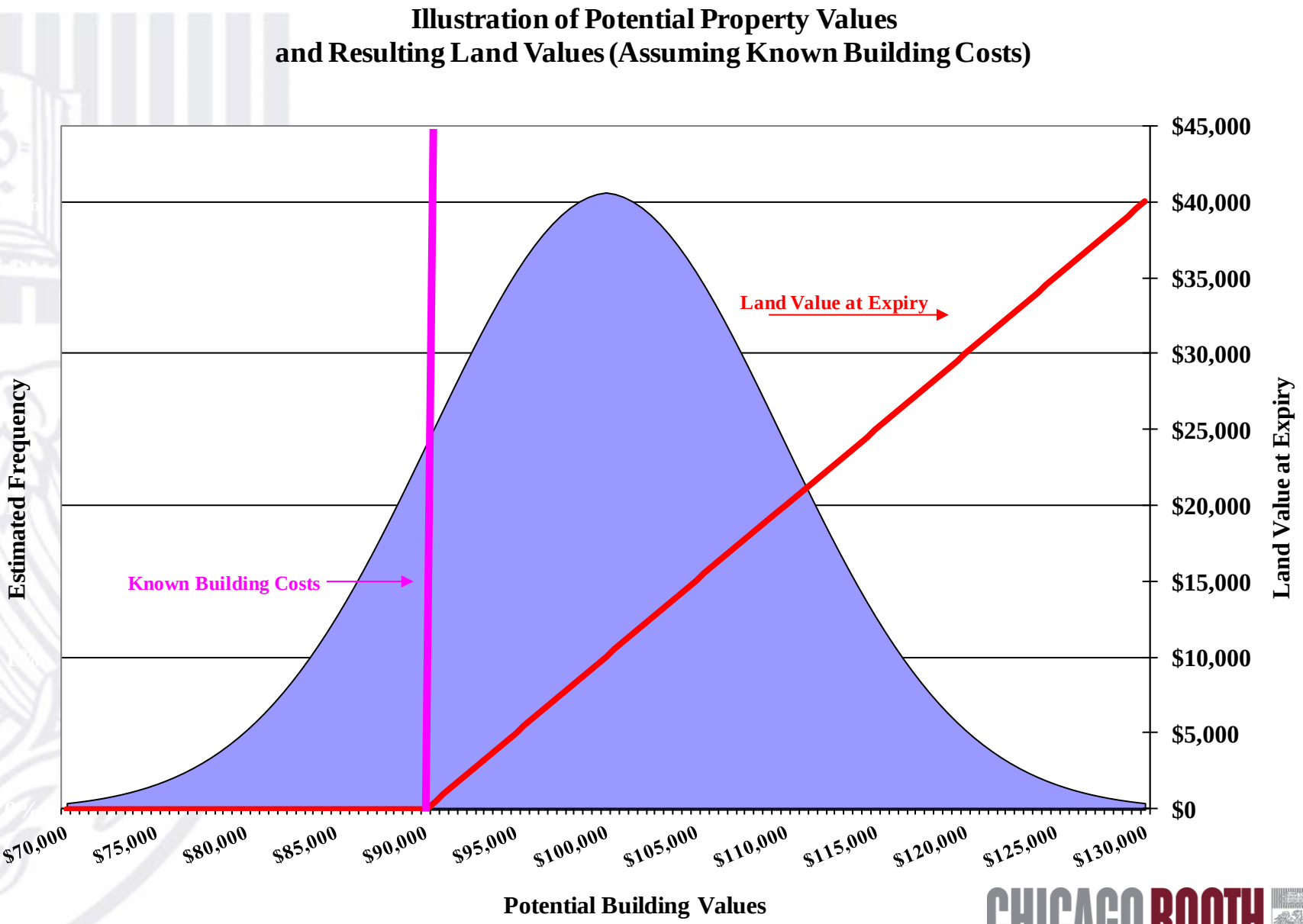
$$\text{Holding Period } (j) = 5 \text{ years}$$

$$\text{Risk-free Rate} = 5\%$$

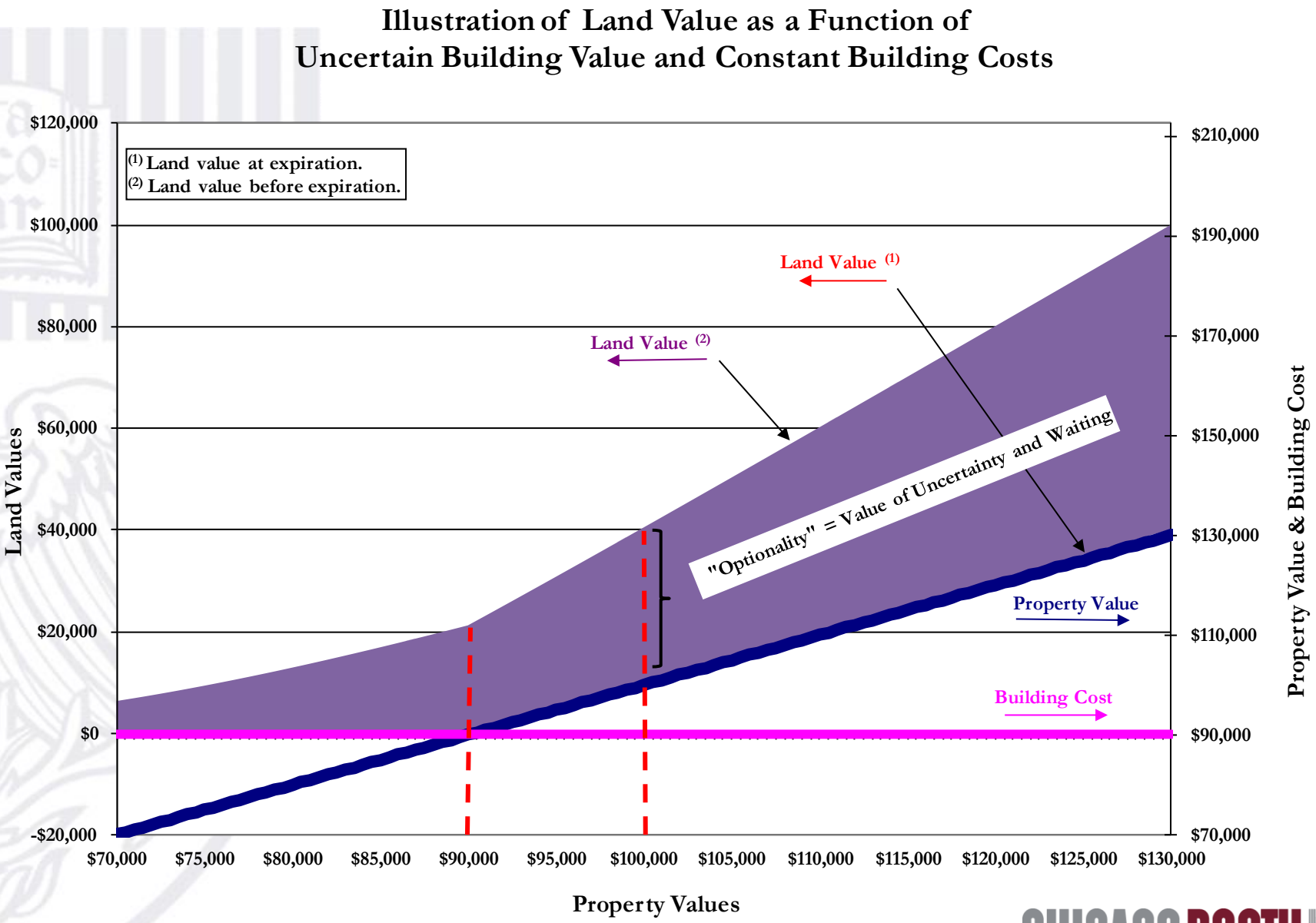
- Result in the following graphical illustrations:

* 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:**

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

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

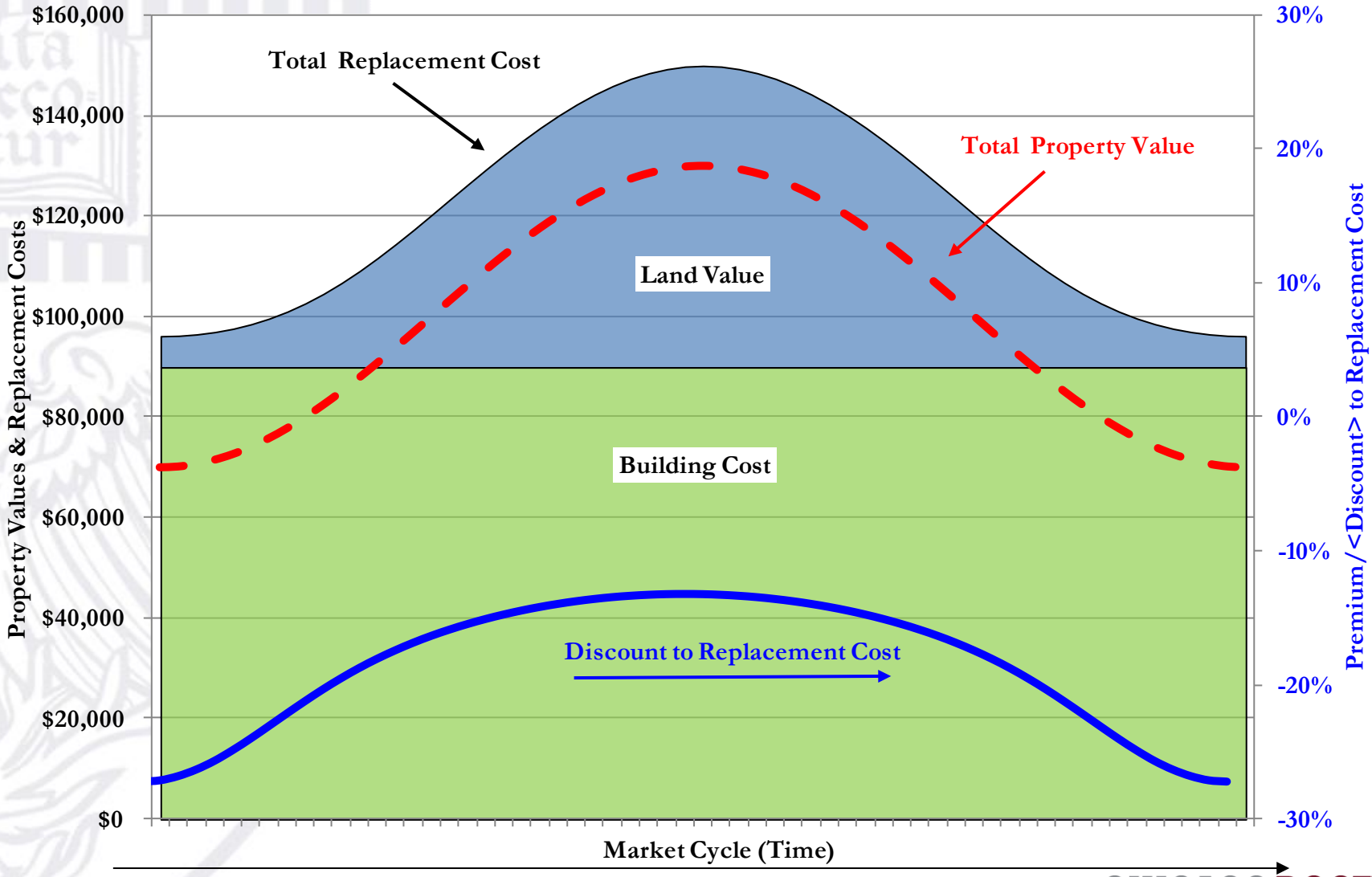
$$= \frac{\text{Building Value}_t}{\text{Building Cost}_t + \text{Building Value}_{t+j} - \text{Building Cost}_{t+j} + \text{"}optionality\text{"}}$$

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

< 1

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

Illustration of Changing Land & Building Values
as Market Value of Total Property Changes over the Real Estate 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	-89.5
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.

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Commercial Real Estate: Past & Future(?)

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  - State & Local Finances
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Let's Revisit the Growth Components of Return

- **Recall: 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 turn, the growth rate can be viewed as a function of inflation (ρ):**

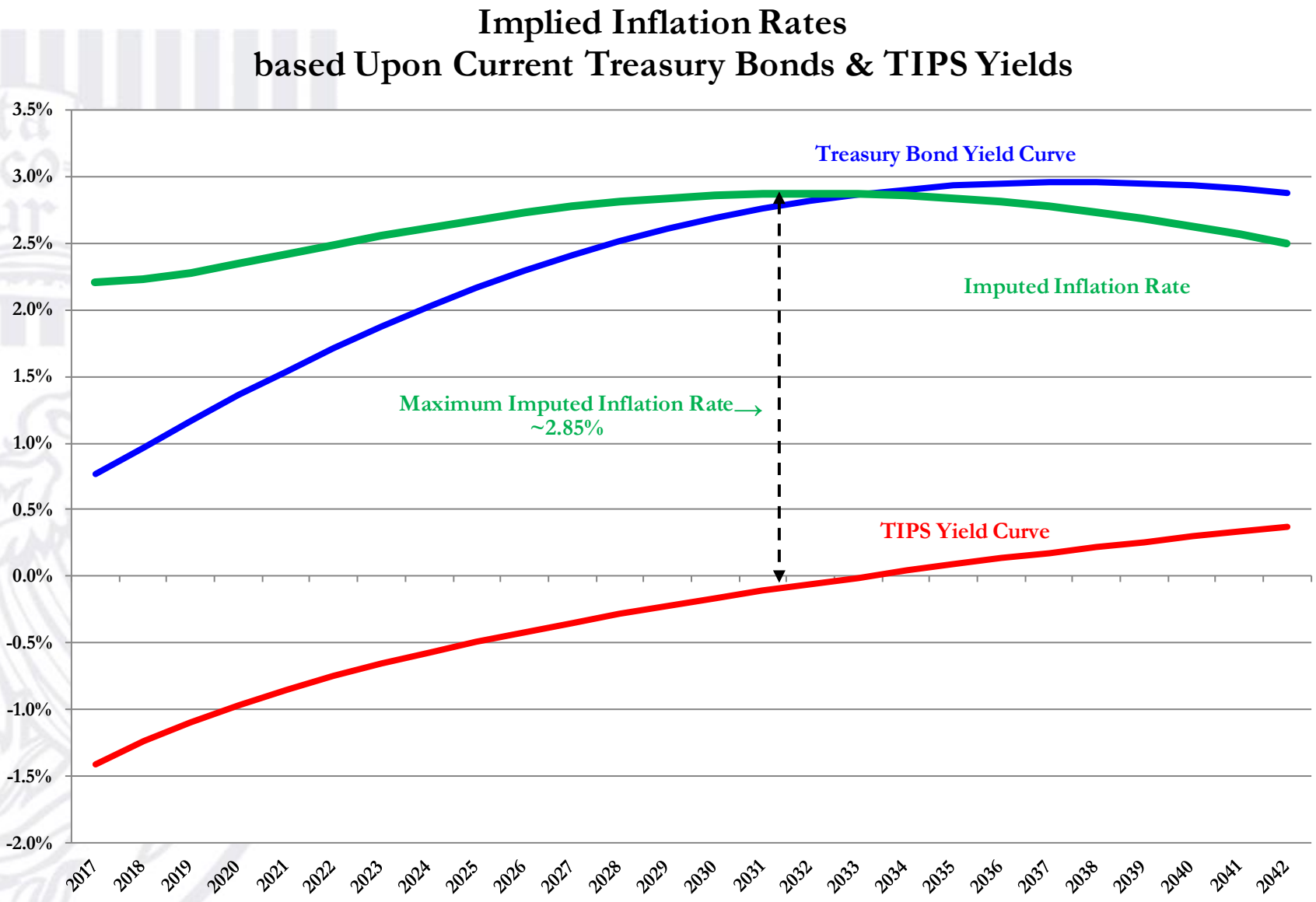
$$g = \lambda * \rho$$

λ = the inflation pass-through rate

- **Historically, λ ~ 75%**

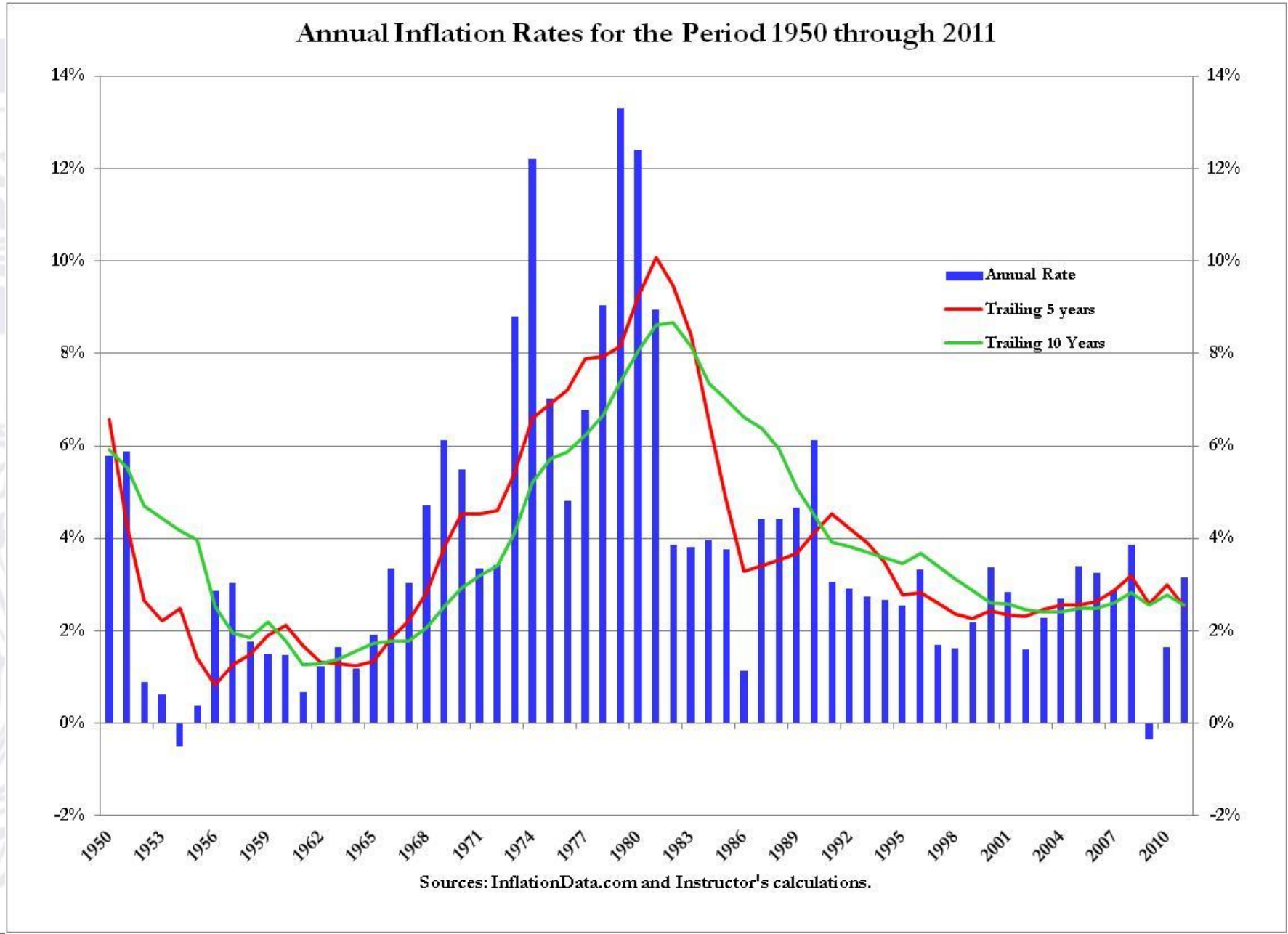
- **So, real estate's ability to (at least partially) hedge inflation may be important**

What Does the Bond Market Suggest?

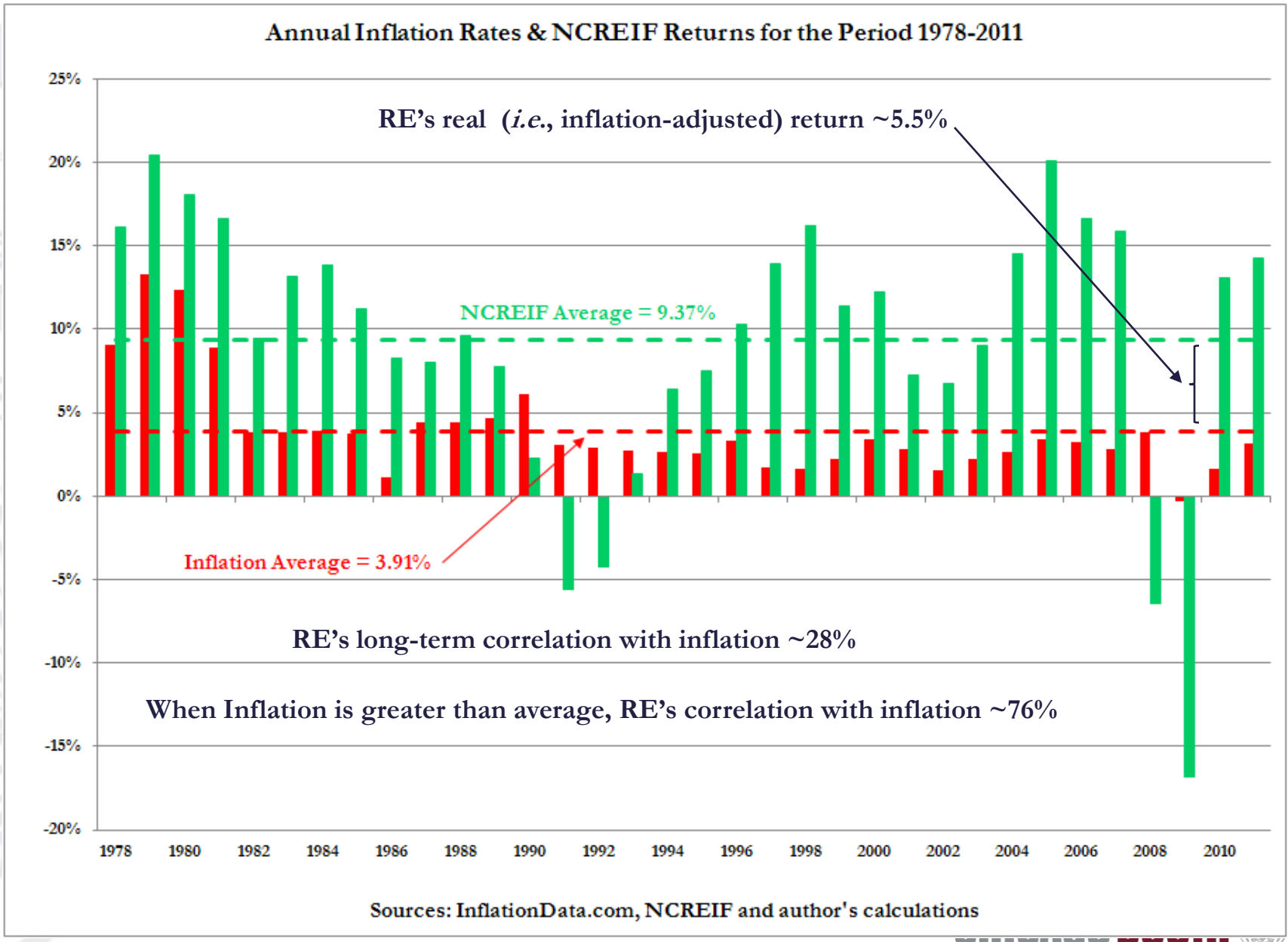


Source: Bloomberg (October 29, 2012) and Instructor's calculations.

Inflation | The Long View



Real Estate's Correlation with Inflation?



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Most of History Has Been Good to Apartments

- Consider the empirical case:

1. Vacancies

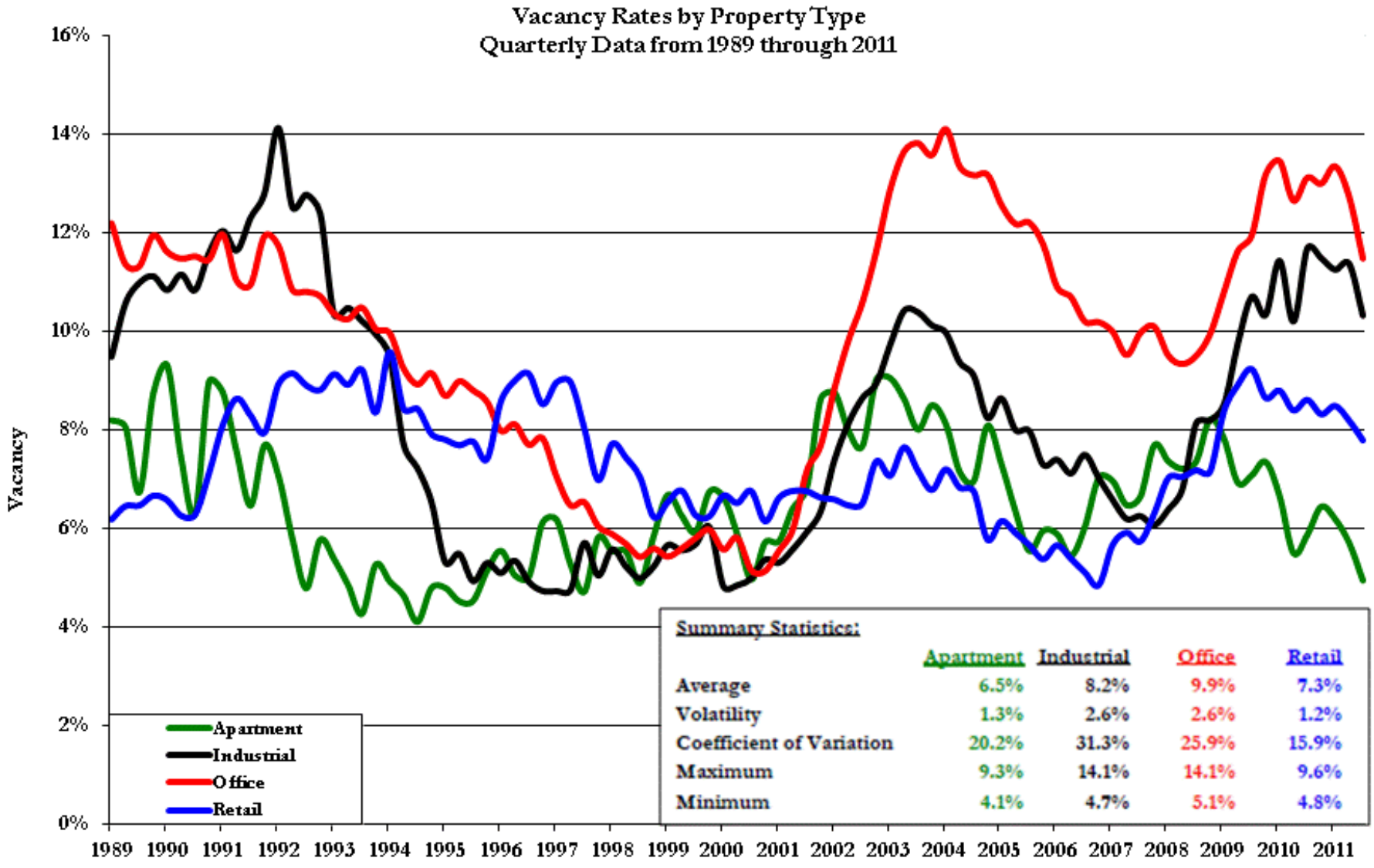
2. Growth in rents

3. Absolute returns

4. Risk-adjusted returns

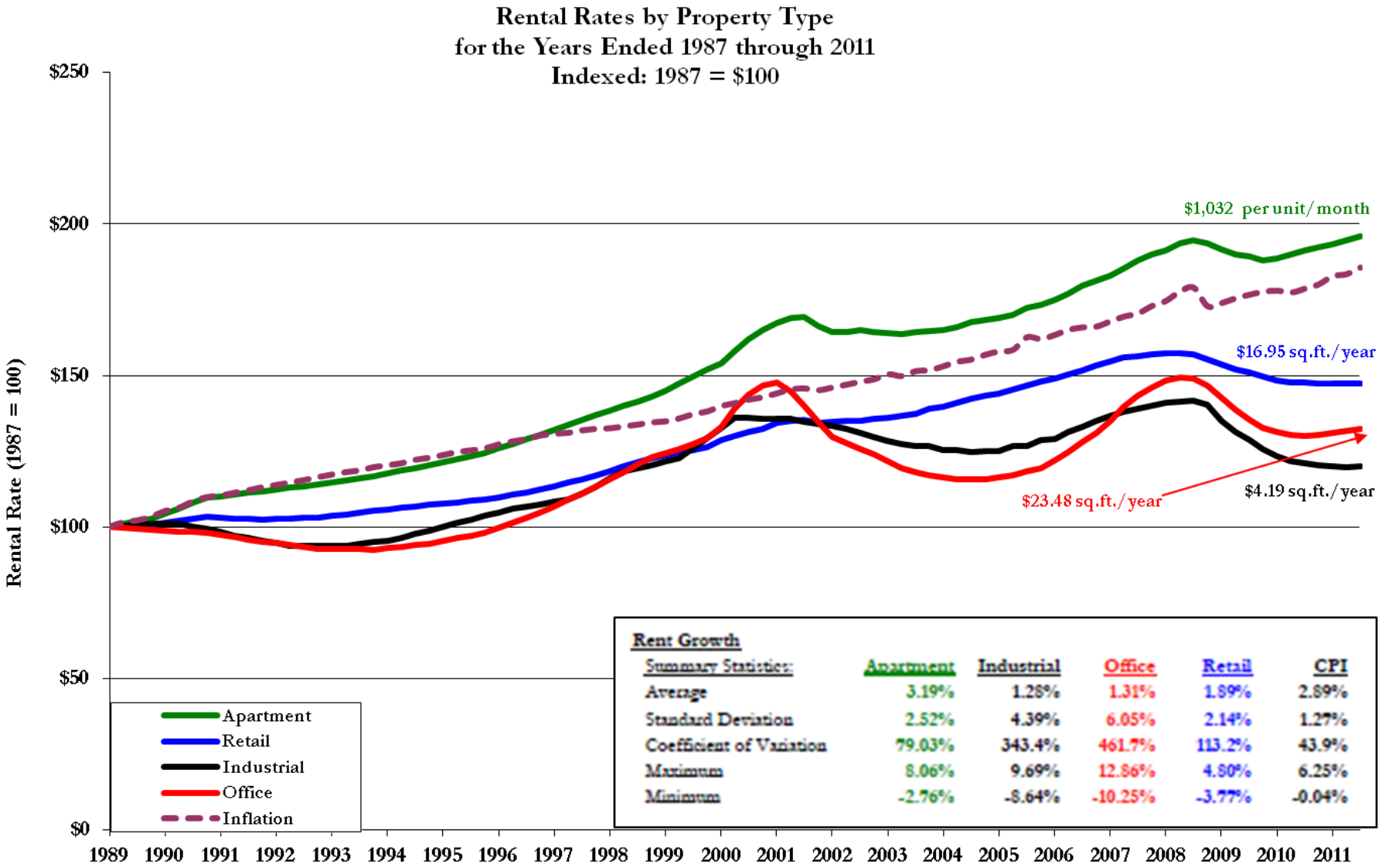
⇨In principle, the "holy grail" for institutional investors

Vacancies | Apartments Have Lowest Average



Sources: NCREIF and Instructor's calculations

The Growth in Rents | Only Apts Beat Inflation

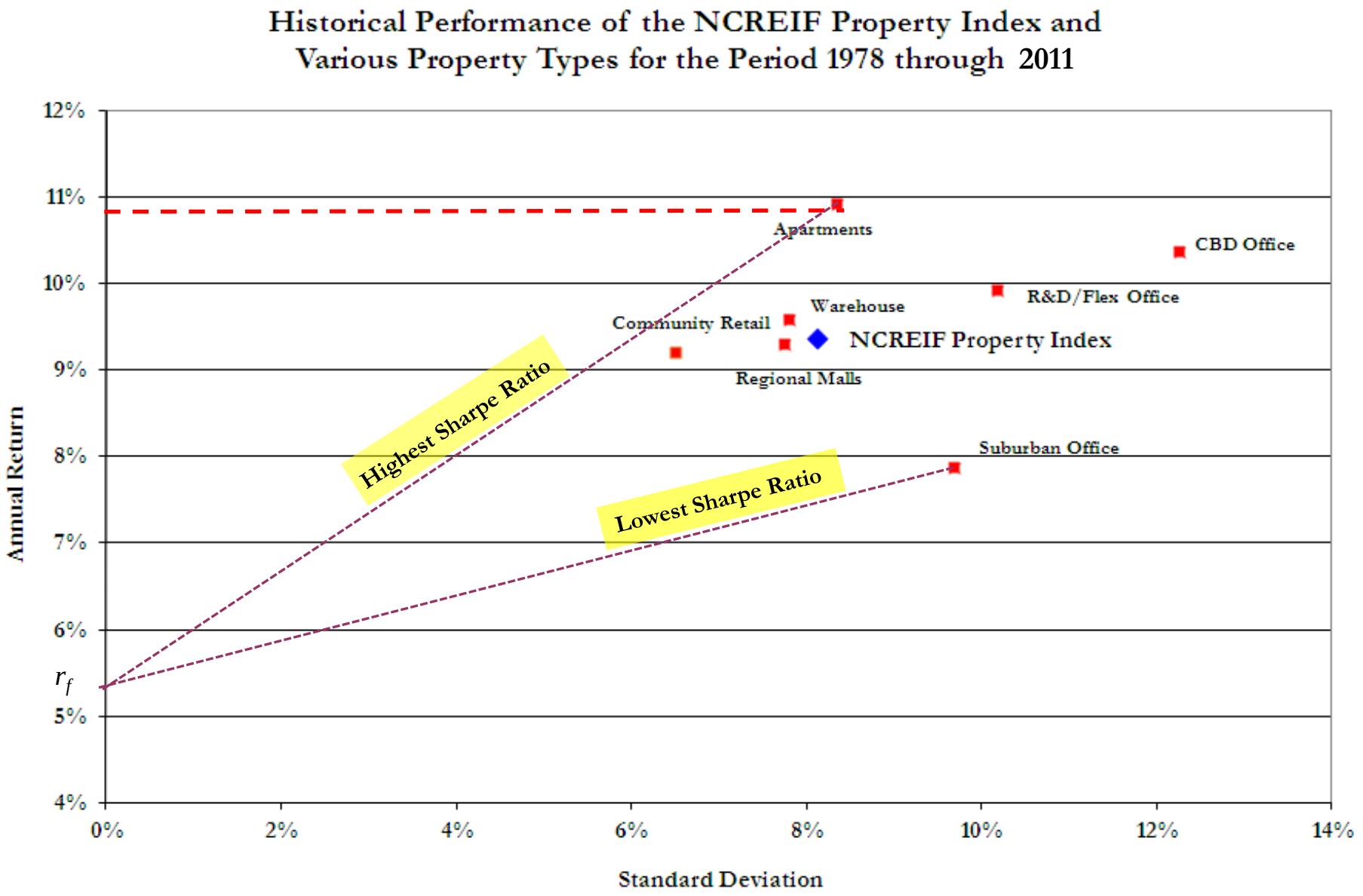


Rent Growth

Summary Statistics:	Apartment	Industrial	Office	Retail	CPI
Average	3.19%	1.28%	1.31%	1.89%	2.89%
Standard Deviation	2.52%	4.39%	6.05%	2.14%	1.27%
Coefficient of Variation	79.03%	343.4%	461.7%	113.2%	43.9%
Maximum	8.06%	9.69%	12.86%	4.80%	6.25%
Minimum	-2.76%	-8.64%	-10.25%	-3.77%	-0.04%

Sources: CB Richard Ellis, REIS and Instructor's calculations

Apartments = Winner | Before & After Risk



Potential Storm Clouds on the Horizon

- Consider the non-empirical case:

1. NIMBY *v.* YIMBY

2. Are cap rates unsustainably low?

   a) At current interest rates, maybe not

   b) At future (higher) interest rates, maybe so

      i. Rates ↑ as a *f*(real return) ⇒ RE ↔ ,↓

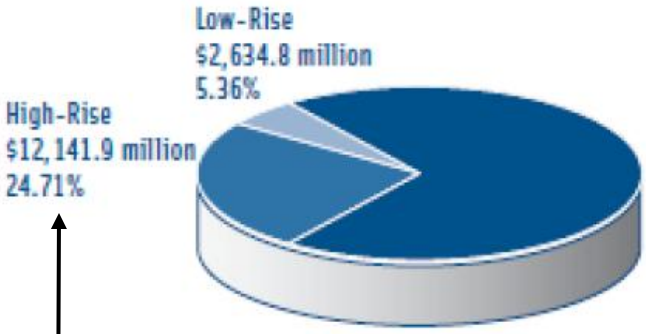
      ii. Rates ↑ as a *f*(inflation) ⇒ RE ↔,↑

   c) Remember Greenspan's admonition

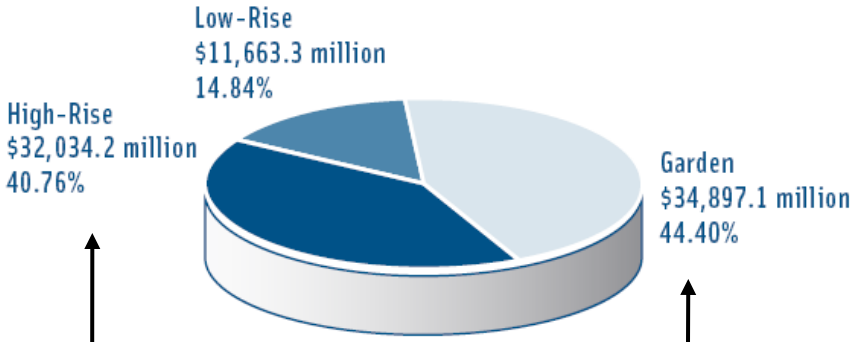
Changing Apartment Composition

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

4th Quarter 2007



2th Quarter 2012

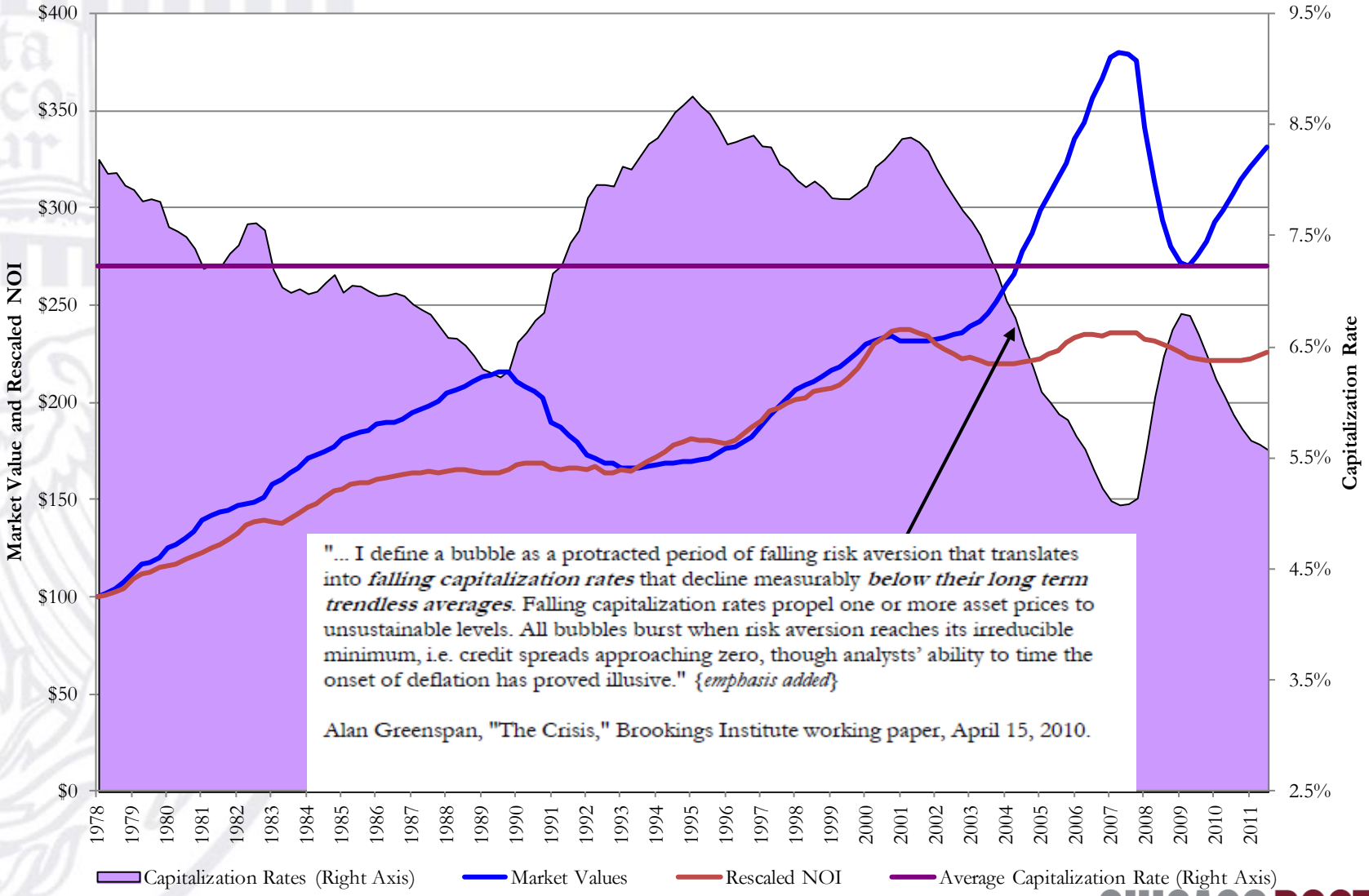


~ no $ Δ

~ 1.5*x* $ Δ

Current Cap Rates | An Admonition

NCREIF Property Index: Market Values, Rescaled NOI and Capitalization Rates Based on a $100 Investment for the Period 1978 through 2012



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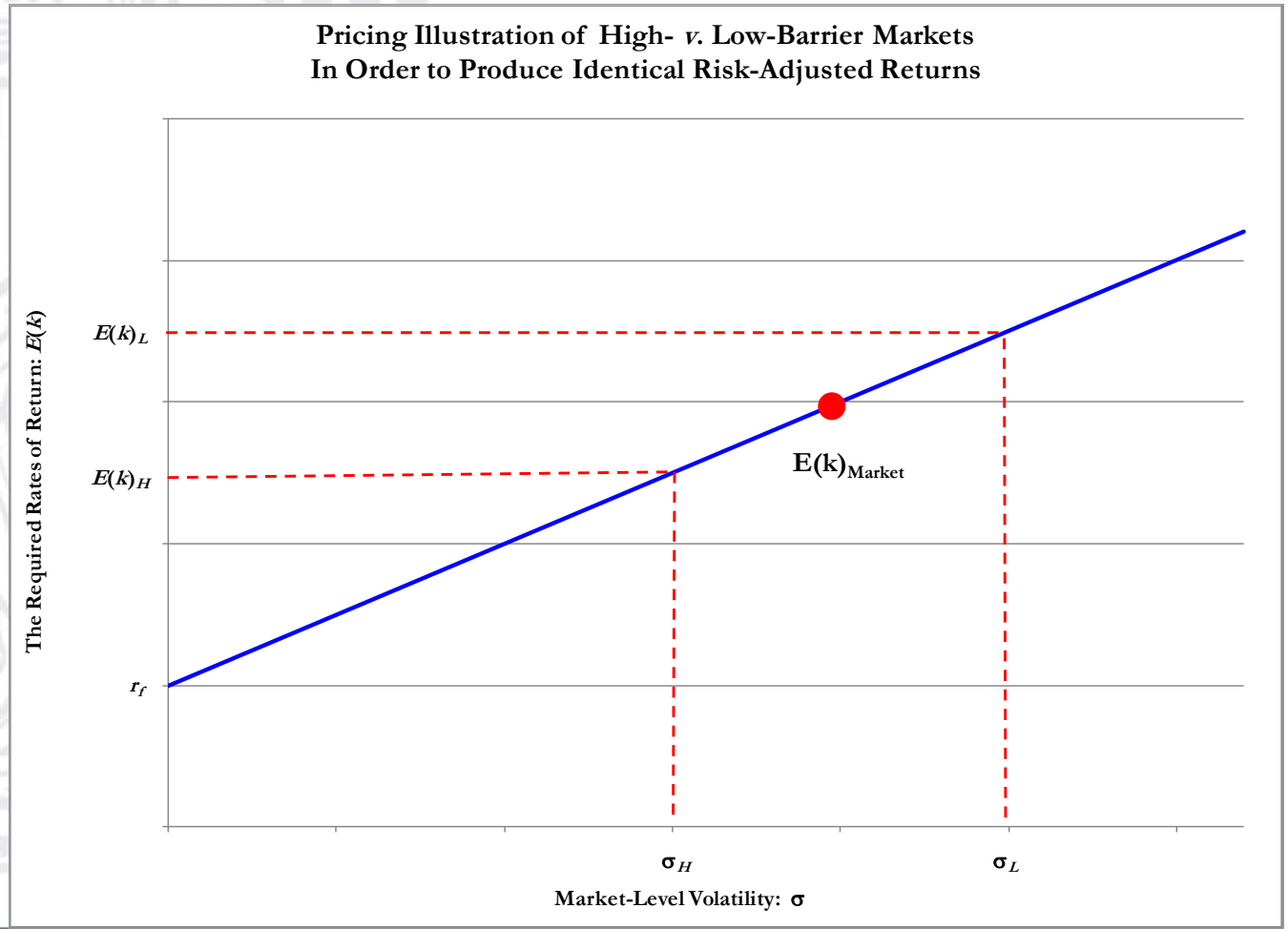
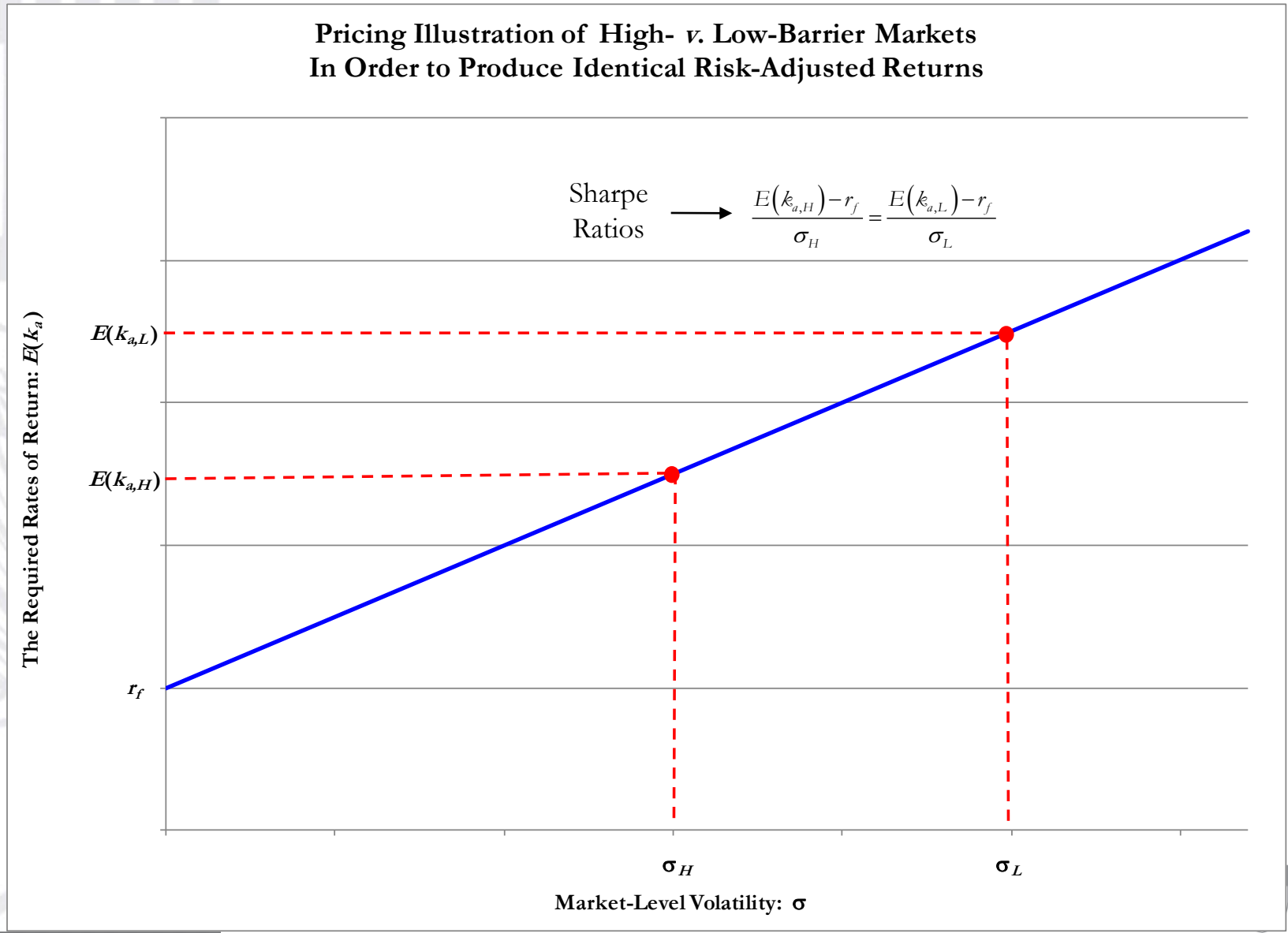
How Should We Think About Risk?

- In principle, all (unlevered) property investments should offer identical risk-adjusted rates of return.
- Because of its popularity, let's frame the discussion in terms of high- *v.* low-barrier markets:



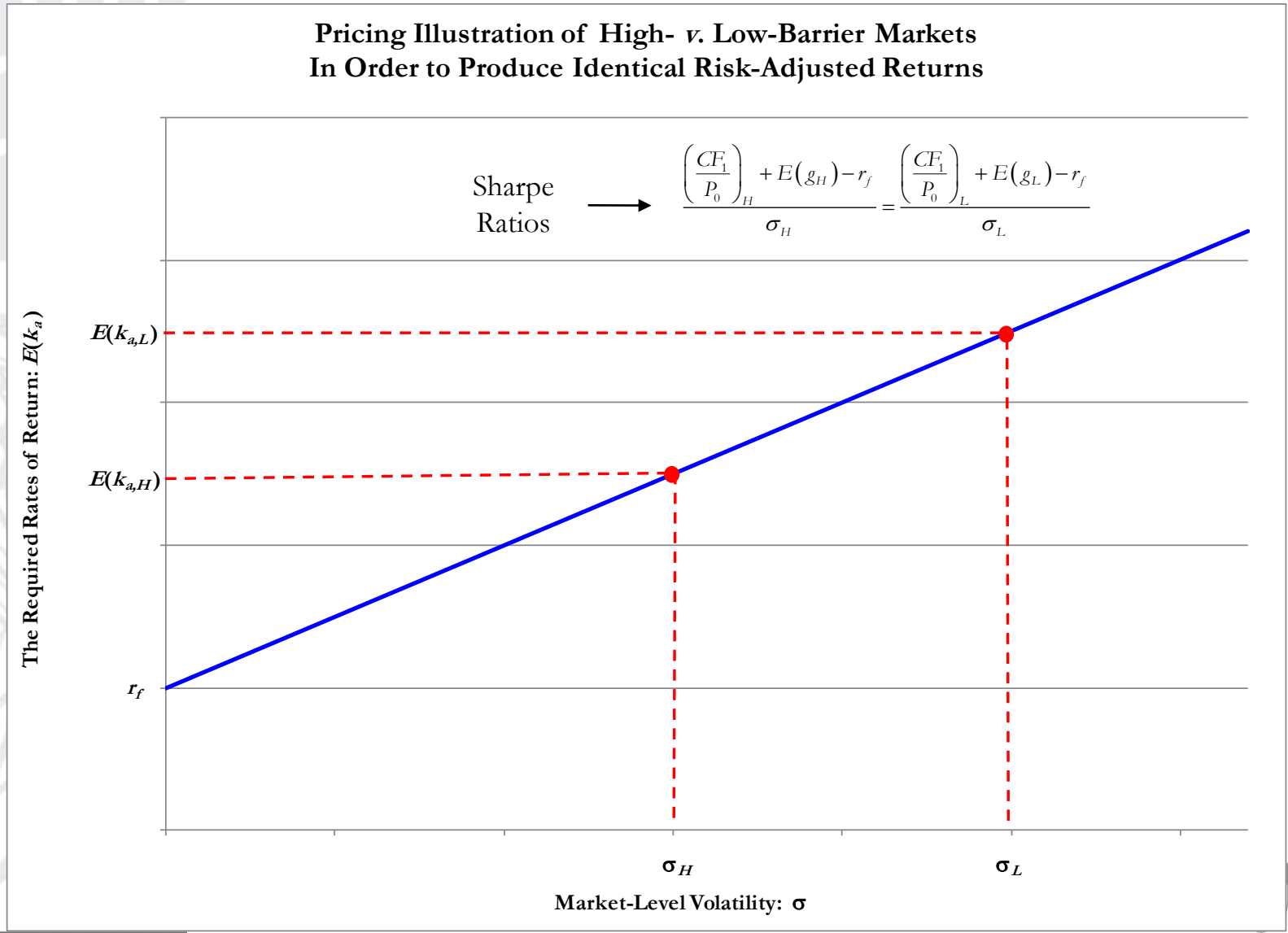
Let's Be a Bit More Specific:

- **Identical risk-adjusted rates of return = identical Sharpe Ratios**



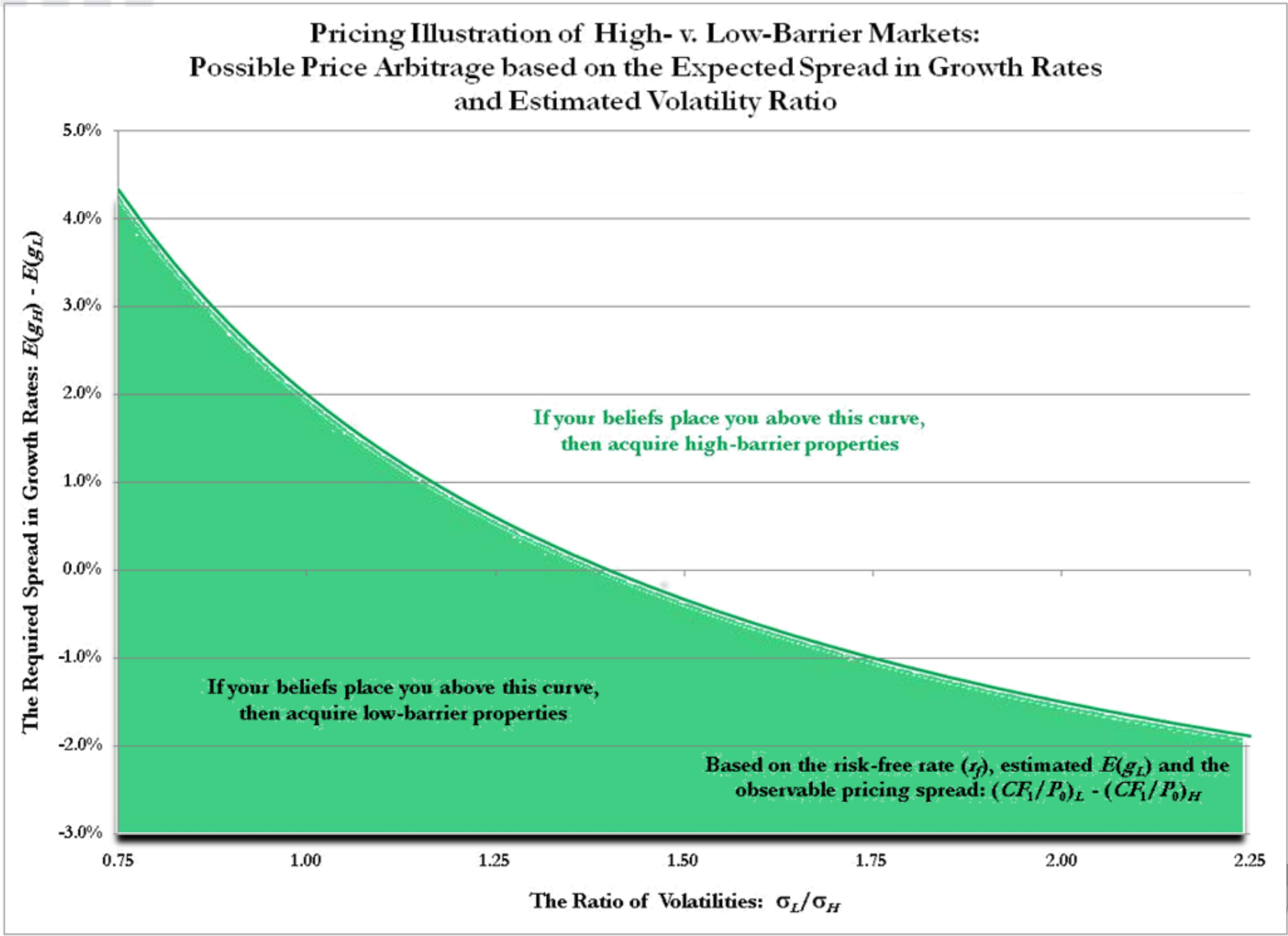
Let's Be a Bit More Specific (continued):

- We can include the expanded view of returns (assuming constant cap rates):



How Should We Think About Investment Opportunities?

- **Based on your beliefs (hopefully supported by research), consider the potential mispricing of markets:**



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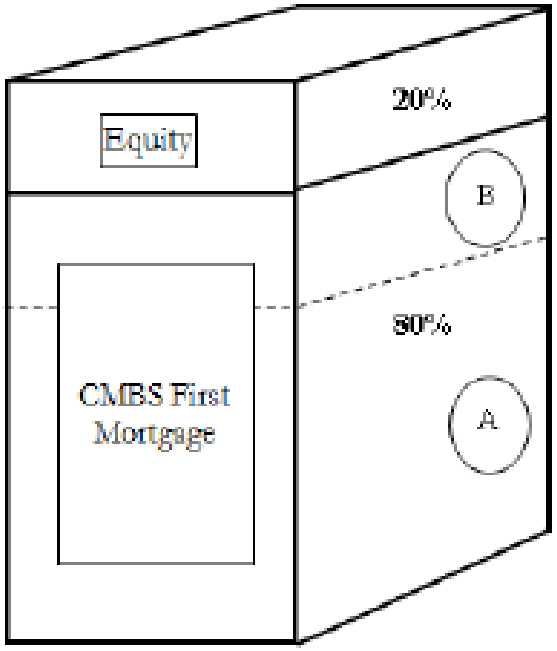
CRE Loans: Foreclosures *v.* Forbearance

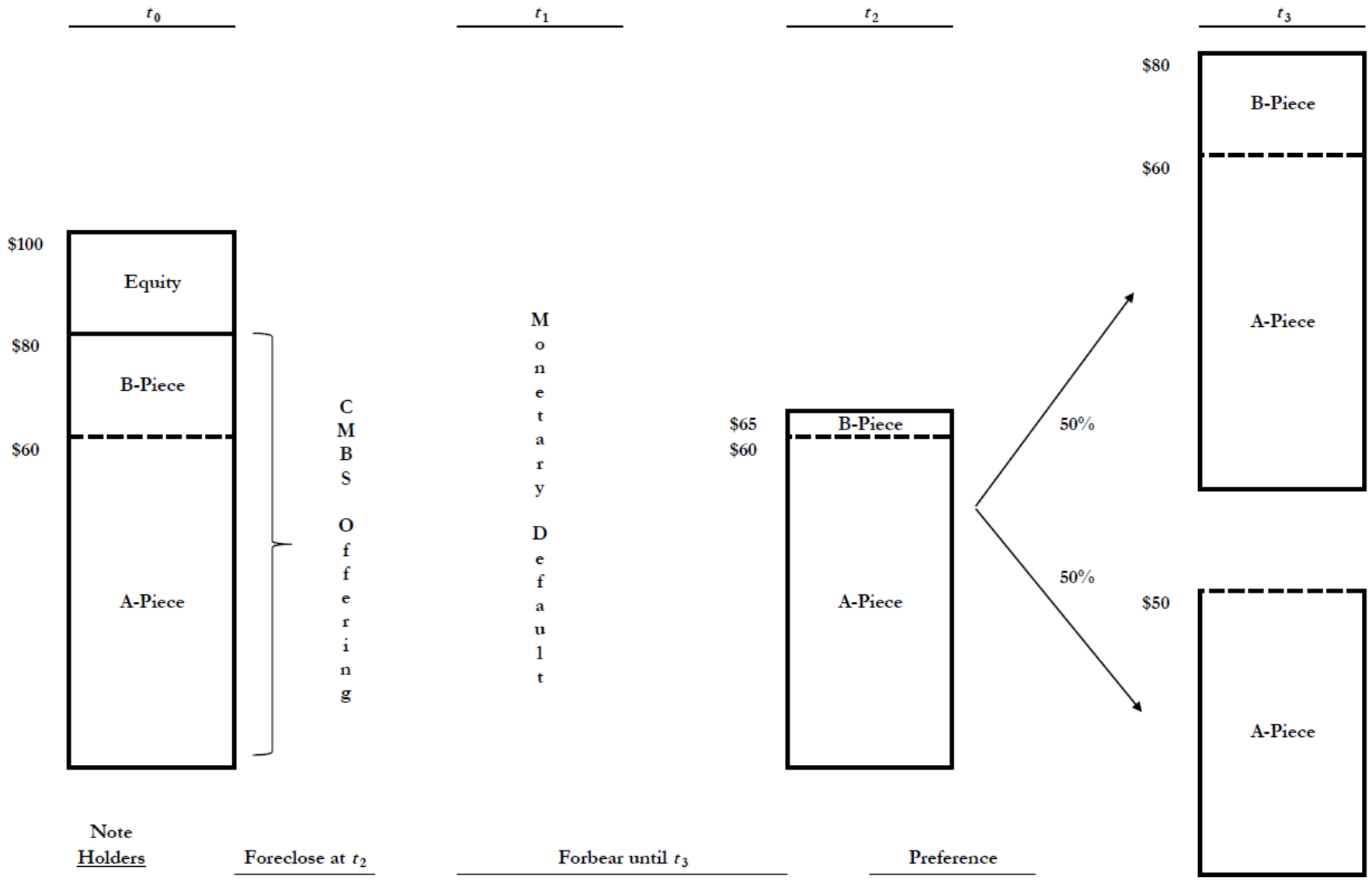
- Upon a monetary default, lenders can choose to foreclose *v.* forbear
- Consider the two sources of most defaults:

1. Commercial Banks: Administration decided to encourage banks to forbear → "extend & pretend"

2. CMBS: the tranched nature of security holders complicates the resolution of delinquent loans. Consider a simple A/B structure:



Inherent Conflicts between Security Tranches



Note Holders	Foreclose at t_2		Forbear until t_3		Preference
A	$60	>	50%* $60 + 50%* $50 = $55	⇨	Foreclose
B	$5	<	50%* $20 + 50%* $0 = $10	⇨	Forbear

The Effect of Forbearance: Undershooting Market?