Some Thoughts on
Past & Future
Real Estate Returns

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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
Historical Growth in U.S. Gross Domestic Product for the Period 1948 through 2012

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

Sources: Bureau of Economic Analysis and author's calculations
Historical Growth in U.S. Gross Domestic Product
In Constant (2005) Dollars for the Period 1948 through 2012

Sources: Bureau of Economic Analysis and author's calculations

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

Historical Unemployment Rate for the Period 1948 through Q1 2013

Stylized Normal Distribution (based on historical μ and σ)

~2.5 σ-Event: Financial Crisis

Sources: Bureau of Labor Statistics and author's calculations
In Real Estate, the Local Market Matters!

By itself, Detroit accounts for ~ 100,000 jobs lost

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?

Domestic Crude Oil Prices (in Constant 2012 Dollars) for the Period 1948 through 2012

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

Residential Real Estate Still in the Doldrums

Annual New Homes Sold & Median Sales Prices: 1963 - 2012

Sources: U.S. Census Bureau, Morningstar and Instructors' Calculations
Home Prices | Approaching a “Lost Decade”

Case-Shiller Home Price Index for the Period 1987 through 2012 for Selected Markets

Source: S&P Case Schiller Index

Back to fall of 2003 prices.
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 for the Period 2000 through 2012

Bubble Growth: Maximum Price Increase from January 2000

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

- Negative equity expected to default
- Private modifications
- HAMP modifications
- 60+ days delinquent loans
- Foreclosure inventory (excluding REOs)

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 and Building Costs as well as Population and Interest Rates from 1890

\[ y = 0.5078x - 884.66 \]

\[ R^2 = 0.468 \]

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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 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

- 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 commercial real estate values

Another Symptom of Financial Distress: State Pension Liabilities

Pension UAAL Per Capita: 10 Most Populous States

Will Aggressiveness Change with State Fortunes?

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The Collapse of the CMBS Market

Annual CMBS Issuance ($ billion)

Source: Commercial Mortgage Alert
A Wave of Refinancings: ~$2.0 trillion Coming Due

Commercial Mortgage Maturities ($Bn)

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

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:

Delinquency and Specially Serviced by Vintage as Percentage of Original Balance
As a % of Original Vintage Balance

Data are as of end of September 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.

Slowing CRE Loan Delinquencies | Property Type

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

Net Changes in Delinquent Universe

Data as of end of September 2012

Delinquencies Lead to Workouts or Foreclosure

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

Cumulative Distress for All Property Types

- 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”?

Q3 Conduit Leverage Tops 100% MLTV

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

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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.
Annoted 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.
What About “Real Time” Indices?

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

Green Street Commercial Property Price Index

Source: Green Street Advisors, *Commercial Property Price Index*, April 4, 2013
What About Differences by Property Types?

- Apartments & malls have recovered most (and hotels the least).
- However, all property types show similar recovery:

  **Green Street Property Sector Indices**

  - **Apartments & Malls:** > 100% of peak prices
  - **Hotels:** > 80% of peak prices

Source: Green Street Advisors, *Commercial Property Price Index*, April 4, 2013
Averages Can Be Misleading

- Said another way: significant differences by quality

![Asset Appreciation in Major v. Non-Major Markets
From December 2000 through January 2013](image)

Source: Real Capital Analytics and Instructor's calculations.
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 \(\frac{CF_1}{P_0}\) 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 \(\nabla\):

\[
k_a = \frac{CF_1}{P_0} + g + \nabla
\]

  - \(\nabla\): 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

Cap Rate Compression/Expansion

-10%  -5%  0%  5%  10%

Cap Rate Compression

Cap Rate Expansion

\[ k_e = \frac{CF_1}{P_0} + g \]
An Overview of Capitalization Rates

Historical Capitalization Rates by Property Type for the Period 2001-2012

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

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Estimated Capitalization Rate (4)</th>
<th>Estimated Dividend Pay-Out Rate (2)(3)</th>
<th>Estimated Cash Flow Rate (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>6.11%</td>
<td>82.5%</td>
<td>5.15%</td>
</tr>
<tr>
<td>Industrial</td>
<td>7.63%</td>
<td>66.0%</td>
<td>4.70%</td>
</tr>
<tr>
<td>Office</td>
<td>7.27%</td>
<td>61.8%</td>
<td>4.48%</td>
</tr>
<tr>
<td>Retail</td>
<td>7.01%</td>
<td>75.0%</td>
<td>5.35%</td>
</tr>
<tr>
<td>All</td>
<td>6.92%</td>
<td>70.4%</td>
<td>4.87%</td>
</tr>
</tbody>
</table>

(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?

Illustration of Relationship between Metro-Area Growth & Risk-Adjusted Returns:
Household Formation vs. Apartment Risk-Adjusted Return for the Ten-Year Period Ended in 2011

\[
y = -0.1281x^2 + 0.3918x + 0.1456
\]
\[
R^2 = 0.2465
\]
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:

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

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

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

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

Risk-free Rate = 5%

- Result in the following graphical illustrations:

* Including developer’s “fair” profit.
Development as an Option [1]

Illustration of Potential Property Values and Resulting Land Values (Assuming Known Building Costs)
Development as an Option [2]

Illustration of Land Value as a Function of Uncertain Building Value and Constant Building Costs

(1) Land value at expiration.
(2) Land value before expiration.

"Optionality" = Value of Uncertainty and Waiting

Property Value & Building Cost

Property Values

Land Values

Land Value (1)

Land Value (2)

Building Cost

Property Value

(1) Land value at expiration.
(2) Land value before expiration.
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:

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

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

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

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

\[
< 1
\]
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: [原创 > 40% loss]

### Performance of Calpers’ Residential-Land Ventures

<table>
<thead>
<tr>
<th>California Urban Real Estate</th>
<th>Inception</th>
<th>12/31/08 Net Assets (SML)</th>
<th>2008 Return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGI-TMG Housing Partners 1</td>
<td>11/06</td>
<td>$1.5 (-61.6)</td>
<td></td>
</tr>
<tr>
<td>Bridge Urban Infill Land Development</td>
<td>6/02</td>
<td>29.9 (-51.1)</td>
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<tr>
<td>Buchanan Urban Investors 2</td>
<td>8/03</td>
<td>339.2 7.5</td>
<td></td>
</tr>
<tr>
<td>California Smart Growth Fund 4</td>
<td>7/06</td>
<td>28.7 (-45.0)</td>
<td></td>
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<tr>
<td>California Urban Investment Partners</td>
<td>2/07</td>
<td>411.3 7.5</td>
<td></td>
</tr>
<tr>
<td>CalSmart</td>
<td>3/01</td>
<td>205.2 (-9.0)</td>
<td></td>
</tr>
<tr>
<td>Canyon Johnson Urban Fund 3</td>
<td>10/08</td>
<td>-5.0 NM</td>
<td></td>
</tr>
<tr>
<td>Centerline Urban Capital 1</td>
<td>6/02</td>
<td>174.3 10.3</td>
<td></td>
</tr>
<tr>
<td>CIM California Urban Real Estate Fund</td>
<td>12/00</td>
<td>610.1 2.7</td>
<td></td>
</tr>
<tr>
<td>CityView America Fund</td>
<td>7/06</td>
<td>20.0 (46.5)</td>
<td></td>
</tr>
<tr>
<td>CityView LA Land Fund 1</td>
<td>4/07</td>
<td>3.2 NM</td>
<td></td>
</tr>
<tr>
<td>KAREC California Development Program</td>
<td>4/02</td>
<td>170.6 -5.2</td>
<td></td>
</tr>
<tr>
<td>KSC Affordable Housing Investment Fund</td>
<td>7/02</td>
<td>31.8 -1.4</td>
<td></td>
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<tr>
<td>Legacy Partners Affordable Housing Fund</td>
<td>6/03</td>
<td>70.9 -0.8</td>
<td></td>
</tr>
<tr>
<td>Pacific Cityhome</td>
<td>9/03</td>
<td>176.6 -16.6</td>
<td></td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Heathstone Housing Partners 2</td>
<td>9/04</td>
<td>114.5 (-46.0)</td>
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<tr>
<td>Heathstone Housing Partners 3</td>
<td>10/03</td>
<td>-5.4 NM</td>
<td></td>
</tr>
<tr>
<td>Heathstone MS Value Added 3</td>
<td>9/03</td>
<td>-1.8 NM</td>
<td></td>
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<tr>
<td>Heathstone Fast-of-Growth Fund</td>
<td>11/05</td>
<td>55.0 (-66.9)</td>
<td></td>
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<tr>
<td>Institutional Housing Partners Investment Fund 1</td>
<td>7/02</td>
<td>164.7 146.6</td>
<td></td>
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<tr>
<td>Institutional Housing Partners Investment Fund 2</td>
<td>9/05</td>
<td>25.3 -30.0</td>
<td></td>
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<tr>
<td>Institutional Housing Partners Investment Fund 3</td>
<td>10/09</td>
<td>357.1 -15.8</td>
<td></td>
</tr>
<tr>
<td>Institutional Housing Partners Investment Fund 5</td>
<td>1/03</td>
<td>16.0 (-47.0)</td>
<td></td>
</tr>
<tr>
<td>M/W Housing Partners 3</td>
<td>1/01</td>
<td>-360.3 NM</td>
<td></td>
</tr>
<tr>
<td>Newland: Cal-Land Asset Partners</td>
<td>8/05</td>
<td>11.9 (-46.8)</td>
<td></td>
</tr>
<tr>
<td>Newland National Partners</td>
<td>10/09</td>
<td>191.6 (-53.1)</td>
<td></td>
</tr>
<tr>
<td>Newland National Partners 2</td>
<td>10/03</td>
<td>176.5 -0.3</td>
<td></td>
</tr>
<tr>
<td>Newland National Partners 3</td>
<td>5/05</td>
<td>83.0 (-85.9)</td>
<td></td>
</tr>
<tr>
<td>Newland National Partners 4</td>
<td>6/05</td>
<td>26.9 (-66.9)</td>
<td></td>
</tr>
<tr>
<td>Resmark: ORA Multifamily Investments 1</td>
<td>12/04</td>
<td>-5.6 NM</td>
<td></td>
</tr>
<tr>
<td>Resmark: ORA Residential Investments 1</td>
<td>10/09</td>
<td>-5.5 (-40.1)</td>
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<tr>
<td>Shear Capital</td>
<td>4/06</td>
<td>53.6 NM</td>
<td></td>
</tr>
<tr>
<td>Shear Mountain House</td>
<td>5/05</td>
<td>149.0 NM</td>
<td></td>
</tr>
<tr>
<td>Wells Fargo Realty: WFAI Housing Fund</td>
<td>9/02</td>
<td>154.0 (-52.5)</td>
<td></td>
</tr>
<tr>
<td>Wells Fargo Realty: Drones Urban Housing</td>
<td>12/01</td>
<td>-4.2 NM</td>
<td></td>
</tr>
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**NM**: Not meaningful due to high negative returns or negative net assets.

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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 ($\frac{CF_1}{P_0}$) 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 ($\rho$):

$$g = \lambda \times \rho$$

$\lambda$ = the inflation pass-through rate

• Historically, $\lambda \sim 75$

• So, real estate’s ability to (at least partially) hedge inflation may be important
What Does the Bond Market Suggest?

Implied Inflation Rates
based Upon Current Treasury Bonds & TIPS Yields

Source: Bloomberg and Instructor's calculations.
Annual Inflation Rates for the Period 1950 through 2012

Sources: InflationData.com and Instructor's calculations.
Real Estate’s Correlation with Inflation?

Annual Inflation Rates & NCREIF Returns for the Period 1978-2012

- Inflation Average = 3.91%
- NCREIF Average = 9.37%
- RE’s real (i.e., inflation-adjusted) return ~5.5%
- RE’s long-term correlation with inflation ~42%
- When Inflation is greater than average, RE’s correlation with inflation ~76%

Sources: InflationData.com, NCREIF and author's calculations
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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

Vacancy Rates by Property Type
Quarterly Data from 1989 through 2011

Summary Statistics:

<table>
<thead>
<tr>
<th></th>
<th>Apartment</th>
<th>Industrial</th>
<th>Office</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>6.5%</td>
<td>8.2%</td>
<td>9.9%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Volatility</td>
<td>1.3%</td>
<td>2.6%</td>
<td>2.6%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>20.2%</td>
<td>31.3%</td>
<td>25.9%</td>
<td>15.9%</td>
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<tr>
<td>Maximum</td>
<td>9.3%</td>
<td>14.1%</td>
<td>14.1%</td>
<td>9.6%</td>
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<tr>
<td>Minimum</td>
<td>4.1%</td>
<td>4.7%</td>
<td>5.1%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Sources: NCREIF and Instructor's calculations
The Growth in Rents | Only Apts Beat Inflation

Rental Rates by Property Type
for the Years Ended 1987 through 2011
Indexed: 1987 = $100

Sources: CB Richard Ellis, REIS and Instructor's calculations
Historical Performance of the NCREIF Property Index and Various Property Types for the Period 1978 through 2012

Apartments = Winner | Before & After Risk

Annual Return vs. Standard Deviation

- Apartments
- CBD Office
- Warehouse
- R&D/Flex Office
- Community Retail
- Regional Malls
- Suburban Office

Highest Sharpe Ratio

Lowest Sharpe Ratio
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 \( f(\text{real return}) \) \( \Rightarrow \) RE ↔,↓
        ii. Rates ↑ as a \( f(\text{inflation}) \) \( \Rightarrow \) 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**

- High-Rise $12,141.9 million (24.71%)
- Low-Rise $2,634.8 million (5.36%)

**4th Quarter 2012**

- Garden $34,356.8 million (69.93%)
- Low-Rise $6,700.0 million (8.32%)
- High-Rise $41,325.2 million (51.29%)

≈ $\Delta \times 2.5$
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

"... I define a bubble as a protracted period of falling risk aversion that translates into falling capitalization rates that decline measurably below their long term trendless averages. Falling capitalization rates propel one or more asset prices to unsustainable levels. All bubbles burst when risk aversion reaches its irreducible minimum, i.e. credit spreads approaching zero, though analysts’ ability to time the onset of deflation has proved illusive."  

(emphasis added)

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
How Should We Think About Risk?

- In principle, all investments should offer identical risk-adjusted returns.
- Let’s frame the discussion in terms of high- vs. low-barrier markets:

Pricing Illustration of High- vs. Low-Barrier Markets
In Order to Produce Identical Risk-Adjusted Returns

\[
\text{The Required Rates of Return: } E(k)
\]

\[
E(k)_L \quad E(k)_H
\]

\[
\sigma_H \quad \sigma_L
\]

Market-Level Volatility: \( \sigma \)
Let’s Be a Bit More Specific:

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

Pricing Illustration of High- vs. Low-Barrier Markets
In Order to Produce Identical Risk-Adjusted Returns

\[
\frac{E(k_{a,H}) - r_f}{\sigma_H} = \frac{E(k_{a,L}) - r_f}{\sigma_L}
\]

The Required Rates of Return: \(E(k_a)\)
Let’s Be a Bit More Specific (continued):

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

\[
\begin{align*}
\text{Sharpe Ratios} & \quad \frac{\left(\frac{CF_1}{p_0}\right)_{H} + E(g_{it}) - r_f}{\sigma_H} = \frac{\left(\frac{CF_1}{p_0}\right)_{L} + E(g_{it}) - r_f}{\sigma_L}
\end{align*}
\]
How Should We Think About Investment Opportunities?

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

Pricing Illustration of High- v. Low-Barrier Markets:
Possible Price Arbitrage based on the Expected Spread in Growth Rates and Estimated Volatility Ratio

If your beliefs place you above this curve, then acquire high-barrier properties.

If your beliefs place you below this curve, then acquire low-barrier properties.

Based on the risk-free rate ($r_f$), estimated $E(g_L)$ and the observable pricing spread: $(C_f/P_0)_L - (C_f/P_0)_H$
Commercial Real Estate: Past & Future(?)

- Macro Factors Affecting Real Estate Returns:
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- Appendices
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CRE Loans: Foreclosures vs. Forbearance

- Upon a monetary default, lenders can choose to foreclose vs. 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

<table>
<thead>
<tr>
<th>Note Holders</th>
<th>Foreclose at $t_2$</th>
<th>Forbear until $t_3$</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$60</td>
<td>$60 + $50 = $55</td>
<td>Foreclose</td>
</tr>
<tr>
<td>B</td>
<td>$5</td>
<td>$20 + $0 = $10</td>
<td>Forbear</td>
</tr>
</tbody>
</table>
The Effect of Forbearance: Undershooting Market?

- **Under-shooting Market**
- **Over-shooting Market**
- "True" Prices

Time

Prices

This is the buying opportunity

This is not
An Illustration of Security Design: Starting Point

Assume a $2.0 billion market capitalization
An Illustration of Security Design: Separation

Assume a $1.5 billion market capitalization

Assume a $0.5 billion market capitalization

Expected Return vs. Risk
Security Design: Can Bundle the Pieces

An Illustration of Security Design: Consolidation

Assume a $1.0 billion market capitalization
Assume a $2.0 billion market capitalization

Expected Return vs. Risk

$r_f$
An Illustration of Security Design: Profiting from Separation?

Note: Lower returns equate to higher prices.

Examples:
1) Treasuries into STRIPS & "zeros,"
2) CMBS into multiple tranches,
3) GGP's bifurcated emergence from bankruptcy, and
4) REITs' (generally) property-type focus.