Monetary Policy and Its Potential Impact on Real Estate

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URBAN LAND INSTITUTE
Urban Development/Mixed-Use Council
Chicago, Illinois
Monetary Policy → Commercial Real Estate

• Monetary Policy: Quantitative Easing
  – Historical Path of Interest Rates
  – Implied Forward Rates
  – Nominal v. Real Yields
  – Quantitative Easing

• Where Might Changing Monetary Policy Affect Real Estate Returns:
  – Commercial Real Estate Pricing
  – Inflation & Commercial Real Estate
  – Loan Maturities
  – The Economy
  – The Housing Market
  – State & Local Finances
Historical Path of Treasury Bond Interest Rates
1-, 10- and 30-year Maturities for the Period 1954 to Current

Note: The 30-year bond series begins in 1977, but was discontinued for four years (2002-2006).
Yield Curve - U.S. Treasuries Rates as of November 4, 2013

Sources: U.S. Department of the Treasury and Instructor's calculations.
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Today’s Rates Imply How Future Rates May Evolve

Assume:

<table>
<thead>
<tr>
<th>Maturity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.00%</td>
</tr>
<tr>
<td>2 years</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

Then:
The implied one-year rate in 12 months is expected to be \( \approx 3.00\% \)

\[
(1+.02)(1+x) = (1+.025)^2
\]

\[
x = \frac{(1+.025)^2}{(1+.02)} - 1
\]

\[
x \approx 3.00\% 
\]

\[x = 3.002\%
\]

- This represents an equilibrium view on the evolution of future interest rates.
- This view is based on the consensus view of market participants. Trades made at the average expectation.
- The bond market’s consensus view has been wrong in the past!
- The bond market’s consensus view is muddied by Quantitative Easing
<table>
<thead>
<tr>
<th>Year</th>
<th>Year/Term</th>
<th>Current Rates</th>
<th>Implied One-year Forward Rates</th>
<th>Implied Five-year Forward Rates</th>
<th>Implied Ten-year Forward Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1</td>
<td>0.08%</td>
<td>0.52%</td>
<td>2.02%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2</td>
<td>0.30%</td>
<td>1.27%</td>
<td>2.69%</td>
<td>0.52%</td>
</tr>
<tr>
<td>2015</td>
<td>3</td>
<td>0.62%</td>
<td>2.16%</td>
<td>3.20%</td>
<td>1.27%</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>1.00%</td>
<td>2.86%</td>
<td>3.59%</td>
<td>2.16%</td>
</tr>
<tr>
<td>2017</td>
<td>5</td>
<td>1.37%</td>
<td>3.32%</td>
<td>3.89%</td>
<td>2.86%</td>
</tr>
<tr>
<td>2018</td>
<td>6</td>
<td>1.69%</td>
<td>3.84%</td>
<td>3.98%</td>
<td>3.32%</td>
</tr>
<tr>
<td>2019</td>
<td>7</td>
<td>2.00%</td>
<td>3.82%</td>
<td>3.98%</td>
<td>3.84%</td>
</tr>
<tr>
<td>2020</td>
<td>8</td>
<td>2.22%</td>
<td>4.12%</td>
<td>4.00%</td>
<td>3.82%</td>
</tr>
<tr>
<td>2021</td>
<td>9</td>
<td>2.43%</td>
<td>4.38%</td>
<td>3.96%</td>
<td>4.12%</td>
</tr>
<tr>
<td>2022</td>
<td>10</td>
<td>2.63%</td>
<td>3.77%</td>
<td>3.87%</td>
<td>4.38%</td>
</tr>
<tr>
<td>2023</td>
<td>11</td>
<td>2.73%</td>
<td>3.83%</td>
<td>3.44%</td>
<td>3.77%</td>
</tr>
<tr>
<td>2024</td>
<td>12</td>
<td>2.82%</td>
<td>3.88%</td>
<td>3.45%</td>
<td>3.83%</td>
</tr>
<tr>
<td>2025</td>
<td>13</td>
<td>2.90%</td>
<td>3.92%</td>
<td>3.47%</td>
<td>3.88%</td>
</tr>
<tr>
<td>2026</td>
<td>14</td>
<td>2.97%</td>
<td>3.95%</td>
<td>3.50%</td>
<td>3.92%</td>
</tr>
<tr>
<td>2027</td>
<td>15</td>
<td>3.04%</td>
<td>3.95%</td>
<td>3.50%</td>
<td>3.95%</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
Current and Implied Forward Five-Year Interest Rates

Rate Available at the End of the Year

Current & Implied 5-Year Rate

[Chart showing interest rate trends from 2013 to 2027]
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Treasury’s v. TIPS → Implications for Future Inflation

Implied Inflation Rates based Upon Current Treasury Bonds & TIPS Yields

Source: Bloomberg (November 1, 2013) and Instructor’s calculations.
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The Role of Quantitative Easing

- In equilibrium, interest rates are based on the consensus view of market participants. Trades made at the average expectation.

- The bond market’s consensus view is muddied by Quantitative Easing, which serves to reduce interest rates as a means of stimulating the economy.
Quantitative Easing & Components of Bond Yields

• In principle, the current yield \((i)\) on bonds equals:

\[
i = (1 + r_{TBs})(1 + E[\rho]) - 1
\approx r_{TBs} + E[\rho]
\]

where: \(r_{TB} = \text{investor’s real-return requirement for Treasury bonds, and} \)
\(E[\rho] = \text{the investor’s expectation of the inflation rate (over the bond’s life).}\)

• The aspiration of QE includes lowering investor’s real-return requirement
  \text{without increasing the investor’s expectation of the inflation rate. (So far, so good.)}

• Ultimately, QE will be unwound. What then?
  
  – \(r_{TBs} \uparrow \Rightarrow \) may be bad for commercial real estate (as well as other asset classes)
  
  – \(E[\rho] \uparrow \Rightarrow \) may be neutral to good for commercial real estate (provided space markers are
    \text{in equilibrium (}\text{i.e., low vacancy}))
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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.
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, 2013

Green Street Commercial Property Price Index is indexed to 100 in August '07.
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 & Retail: > 100% of peak prices
- Hotels: > 80% of peak prices

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

- Said another way: significant differences by quality

Illustration of Asset Appreciation in Major vs. Non-Major Markets
From December 2000 through August 2013

Ratio of Non-Major to Major Markets

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

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

- \( \nabla \): More easily seen in the following graph.

Note: cap rate = NOI\(_1\)/\( P_0 \) ≠ 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

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

Total Annual Return

Holding Period (Years)
An Overview of Capitalization Rates

Historical Capitalization Rates by Property Type for the Period 2001-Q3 2013

Source: Real Capital Analytics.
**Cap Rates → Cash-Flow Yield**

- Significant ambiguities surrounding cap rates.
- Apartments have a very different “cap ex” behavior:

  **An Illustration:**
  Conversion of Cap Rates to Cash Flow Yields

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Estimated Capitalization Rate</th>
<th>Estimated Dividend Pay-Out Ratio</th>
<th>Estimated Cash Flow Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>6.25%</td>
<td>80.7%</td>
<td>5.04%</td>
</tr>
<tr>
<td>Industrial</td>
<td>7.66%</td>
<td>67.7%</td>
<td>5.19%</td>
</tr>
<tr>
<td>Office</td>
<td>6.68%</td>
<td>64.7%</td>
<td>4.32%</td>
</tr>
<tr>
<td>Retail</td>
<td>7.12%</td>
<td>69.9%</td>
<td>4.98%</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td><strong>6.93%</strong></td>
<td><strong>67.2%</strong></td>
<td><strong>4.66%</strong></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.
Like bond investors, real estate investors want:

\[ k_{a,RE} = (1 + r_{RE})(1 + \rho) - 1 \]

Can compare what investors want (above) to what they are likely to receive (#19):

\[ (1 + r_{RE})(1 + \rho) - 1 = \frac{CF_0(1 + g)}{P_0} + g \]

Additionally, we can think of the growth rate \((g)\) as: \(g = \lambda \cdot \rho\)
where: \(\lambda\) = the inflation pass-through rate

Therefore, we can restate our comparison (from above):

\[ (1 + r_{RE})(1 + \rho) - 1 = \frac{CF_0(1 + \lambda \rho)}{P_0} + \lambda \rho \]

[For simplicity, let’s ignore capitalization rate shifts and express expected inflation as merely \(\rho\).]
Fundamental Components of Real Estate Returns: Revisited

• Assume the real estate’s space markets are in equilibrium: ⇒ λ = 1
• When markets in equilibrium, our earlier comparison simplifies to:
  \[(1 + r_{RE})(1 + \rho) - 1 = \frac{CF_0 (1 + \rho)}{P_0} + \rho\]
• With a little bit of math, it can be shown that:
  \[r_{RE} = \frac{CF_0}{P_0}\]
• Note that:
  – In equilibrium, real estate values (P₀) are unaffected by a change in anticipated inflation (because \(\rho\) does not appear above).
  – In equilibrium, real estate values (P₀) are only affected by a change in the required real return (\(r_{RE}\)).
  – In disequilibrium (λ = 1), real estate values (P₀) are affected by both changes in the required real return (\(r_{RE}\)) and a change in the anticipated inflation rate (\(\rho\)).
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 \(\left(\frac{CF_1}{P_0}\right)\) 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 \((\rho)\):

\[
g = \lambda \ast \rho
\]

\(\lambda\) = the inflation pass-through rate

• Historically, \(\lambda \sim 75\%

• So, real estate’s ability to (at least partially) hedge inflation may be important
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Annual Inflation Rates for the Period 1950 through 2012

Sources: InflationData.com and Instructor's calculations.
Annual Inflation Rates for the Period 1913 - YTD 2013

Average = 3.5%
Average + σ = 9.3%
Average - σ = -2.3%
Average + σ = 4.1%
Average = 3.0%
Average - σ = 1.8%

Reagan/Volcker
Real Estate’s Correlation with Inflation?

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

- RE’s real (i.e., inflation-adjusted) return ~5.5%
- NCREIF Average = 9.37%
- Inflation Average = 3.91%
- RE’s long-term correlation with inflation ~28%
- When Inflation is greater than average, RE’s correlation with inflation ~76%

Sources: InflationData.com, NCREIF and author's calculations
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The Collapse of the CMBS Market

Annual CMBS Issuance ($ billions)

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

- Current Balance as % of Original [L]
- Delinquency Rate as % of Original Balance [R]
- SS Rate as % of Original Balance [R]

Data are as of end of September 2012.

Delinquencies Lead to Workouts or Foreclosure

- So far, we’re at ~ $400 billion of workouts or foreclosures
- About 1/2 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 2013”
Lessening CMBS Underwriting Standards to the Rescue?

• Another case of “here we go again”?

Conduit Leverage Holds Near CMBS 2.0 High Water Mark During Q3 2013

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

Historical Growth in U.S. Gross Domestic Product for the Period 1948 through Q2 2013

Annual Change in GDP

Sources: Bureau of Economic Analysis and author's calculations
Return = \( f(\text{Economy, etc.}) \) | The Long View


Sources: Bureau of Economic Analysis and author's calculations
Return = f(Employment, etc.) | The Long View

Historical Unemployment Rate
for the Period 1948 through Q2 2013

Source: Bureau of Labor Statistics
Return = f(Employment, etc.) | The Long View

Historical Unemployment Rate for the Period 1948 through Q2 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:
  - Crude oil prices?
  - Terrorist attack(s)?
  - Contagious financial crisis?
  - Natural disasters (Sandy)?
  - Partisan political bickering increases (fiscal cliff)?

![Domestic Crude Oil Prices (in Constant 2012 Dollars) for the Period 1948 through Q2 2013](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
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

- Net Annual Appreciation Rate of 4%
- Net Annual Appreciation Rate of 2.5%
- Net Annual Appreciation Rate of 0%
- The Rate of Inflation (\(\rho\))

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 disproportionally 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 \textit{(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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• 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- $v$. low-barrier markets:

\[
\begin{align*}
\text{Pricing Illustration of } & \text{ High- } v. \text{ Low-Barrier Markets} \\
& \text{In Order to Produce Identical Risk-Adjusted Returns}
\end{align*}
\]
Let’s Be a Bit More Specific:

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

Pricing Illustration of High- \( v \) Low-Barrier Markets
In Order to Produce Identical Risk-Adjusted Returns

\[
\text{Sharpe Ratios} \quad \frac{E(\kappa_{a,H}) - r_f}{\sigma_H} = \frac{E(\kappa_{a,L}) - r_f}{\sigma_L}
\]

\( E(k_{a,L}) \)

\( E(k_{a,H}) \)

\( r_f \)

\( \sigma_H \)

\( \sigma_L \)

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

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

\[
\sigma_{H} = \frac{\left( \frac{CF_{1}}{p_{0}} \right)_{H} + E(g_{H}) - r_{f}}{\left( \frac{CF_{1}}{p_{0}} \right)_{L} + E(g_{L}) - r_{f}} \]

### Pricing Illustration of High- v. Low-Barrier Markets

In Order to Produce Identical Risk-Adjusted Returns

- Sharpe Ratios

\[
E(k_{a,L}) = \sigma_{H} \]

\[
E(k_{a,H}) = \sigma_{L} \]

- Market-Level Volatility: $\sigma$
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: \( (CF_L/P_0)_L - (CF_H/P_0)_H \).
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  - The Economy
  - The Housing Market
  - State & Local Finances

- Appendices
  - Growth at What Price?
  - CMBS Dysfunction
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

<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>

Monetary Default

$t_0$
- Equity $100$
- B-Piece $80$
- A-Piece $60$

$t_1$
- CMBS Offering

$t_2$
- B-Piece $65$
- A-Piece $60$

$t_3$
- B-Piece $80$
- A-Piece $60$
- A-Piece $50$

50% 50% 50%
The Effect of Forbearance: Undershooting Market?

This is the buying opportunity

This is not

“True” Prices

Over-shooting Market

Under-shooting Market

Time

Prices
An Illustration of Security Design: Starting Point

Assume a $2.0 billion market capitalization
Security Design: Can Unbundle the Bundle

An Illustration of Security Design: Separation

Assume a $1.5 billion market capitalization

Assume a $0.5 billion market capitalization
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

$F$
Security Design: What About CMBS?

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.