The Real Estate Market’s Impact on State & Local Pension Plans: Some Observations

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Federal Reserve Bank of Atlanta
Real Estate’s Impact on Pension Funds

• **Why Commercial Real Estate?**
  – Historical multi-asset returns
  – Increasing allocations to “alternatives” – including real estate
  – Large funds tend to have higher real estate allocations

• **A Return to Core Real Estate**
  – Traditionally, pension plans were “core” investors
  – In a reach for return, explosive growth in non-core funds
  – Then, a correction and return to core. Why?
  – Examining disappointing non-core performance.

• **Private-Market Commercial Real Estate Spillover:**
  – Public Real Estate Equities
  – Commercial Real Estate Lending

• **Feedback System: Housing ↔ Commercial Real Estate**

• **Conclusions**

• **Appendices**
Why the Interest in Real Estate?

Performance of Major Asset Classes
for the Period 1978 through 2009

Source: Morningstar
Declining Expected Portfolio Returns

- The increased allocation to alternative investments is at least partly attributable to the decline in the assumed rate of return on (defined-benefit) pension assets.

Source: *Pension & Investments*, August 23, 2010
Public Pension Fund Increase Alternatives

• “The largest public pension plans have almost doubled their target allocations to alternative investments in the past five years. The median allocation now stands at 20%”

Aaron Cunningham, Pension & Investments, August 23, 2010
Who Are the Large Pension Fund Investors?

## Top 20 Public Pension Funds Based on Real Estate Holdings as of September, 2009
based upon Defined-Benefit Holdings

<table>
<thead>
<tr>
<th>Rank</th>
<th>Pension Fund</th>
<th>Total Assets (in $millions)</th>
<th>Real Estate Holdings (in $millions)</th>
<th>Real Estate Holdings as a Percentage of Total Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>California State Teachers' Retirement System</td>
<td>$130,257</td>
<td>$12,711</td>
<td>9.8%</td>
</tr>
<tr>
<td>2.</td>
<td>California Public Employees' Retirement System</td>
<td>197,610</td>
<td>12,554</td>
<td>6.4%</td>
</tr>
<tr>
<td>3.</td>
<td>State Board of Administration of Florida</td>
<td>110,050</td>
<td>6,585</td>
<td>6.0%</td>
</tr>
<tr>
<td>4.</td>
<td>New York State Common Retirement Fund</td>
<td>125,692</td>
<td>6,150</td>
<td>4.9%</td>
</tr>
<tr>
<td>5.</td>
<td>New York State Teachers' Retirement System</td>
<td>77,640</td>
<td>5,679</td>
<td>7.3%</td>
</tr>
<tr>
<td>7.</td>
<td>State Teachers' Retirement System of Ohio</td>
<td>57,896</td>
<td>4,335</td>
<td>7.5%</td>
</tr>
<tr>
<td>8.</td>
<td>Oregon Public Employees Retirement Fund</td>
<td>50,556</td>
<td>4,030</td>
<td>8.0%</td>
</tr>
<tr>
<td>9.</td>
<td>Ohio Public Employees Retirement System</td>
<td>67,321</td>
<td>3,855</td>
<td>5.7%</td>
</tr>
<tr>
<td>10.</td>
<td>Pennsylvania Public School Employees' Retirement</td>
<td>45,740</td>
<td>3,835</td>
<td>8.4%</td>
</tr>
<tr>
<td>11.</td>
<td>Teachers' Retirement System of the State of Illinois</td>
<td>31,326</td>
<td>3,312</td>
<td>10.6%</td>
</tr>
<tr>
<td>12.</td>
<td>Teacher Retirement System of Texas</td>
<td>91,358</td>
<td>3,152</td>
<td>3.5%</td>
</tr>
<tr>
<td>13.</td>
<td>Los Angeles County Employees' Retirement Association</td>
<td>33,363</td>
<td>3,107</td>
<td>9.3%</td>
</tr>
<tr>
<td>14.</td>
<td>Massachusetts Pension Reserves Investment Management Board</td>
<td>41,757</td>
<td>3,054</td>
<td>7.3%</td>
</tr>
<tr>
<td>15.</td>
<td>North Carolina Retirement Systems</td>
<td>65,881</td>
<td>3,035</td>
<td>4.6%</td>
</tr>
<tr>
<td>16.</td>
<td>Virginia Retirement System</td>
<td>46,912</td>
<td>2,838</td>
<td>6.0%</td>
</tr>
<tr>
<td>17.</td>
<td>State of Wisconsin Investment Board</td>
<td>70,925</td>
<td>2,377</td>
<td>3.4%</td>
</tr>
<tr>
<td>18.</td>
<td>Public Employees' Retirement Association of Colorado</td>
<td>32,151</td>
<td>2,200</td>
<td>6.8%</td>
</tr>
<tr>
<td>19.</td>
<td>Retirement Systems of Alabama</td>
<td>23,624</td>
<td>2,090</td>
<td>8.8%</td>
</tr>
<tr>
<td>20.</td>
<td>Alaska Retirement Management Board</td>
<td>13,710</td>
<td>1,702</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

**Total/Average - Top 20**

- Total Assets: $1,360,194
- Real Estate Holdings: $91,178
- Real Estate Holdings as a Percentage of Total Assets: 6.7%

**Total/Average - Top 50**

- Total Assets: $1,997,644
- Real Estate Holdings: $115,874
- Real Estate Holdings as a Percentage of Total Assets: 8.8%

Source: *Pensions & Investments* and author's calculations.

Note: Real estate figures exclude REITs, timber and agriculture.
More Broadly, Consider Plan’s RE Holdings

- The allocations of defined-benefit plans to (commercial) real estate have been generally increasing over the last 15 years or so.

- This increase has generally come at the expense of bond allocations (and, to a much lesser extent, cash allocations).

- As compared to other types of plans, public plans’ allocations to real estate is typically:
  - higher than corporate plans, but
  - below endowment/foundations and union plans.

### Exhibit 2: Plan Sponsor Asset Allocation 1996–2009

Plans Reporting Real Estate Equities for All Years—Sample Group. Percentage Allocation—Major Asset Type

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>By Type</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>4.9</td>
<td>4.8</td>
<td>4.5</td>
<td>4.6</td>
<td>4.4</td>
<td>4.9</td>
<td>5.6</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
<td>6.2</td>
<td>7.5</td>
<td>7.8</td>
<td>7.9</td>
</tr>
<tr>
<td>Corporate</td>
<td>4.5</td>
<td>4.0</td>
<td>3.6</td>
<td>3.1</td>
<td>2.9</td>
<td>2.7</td>
<td>3.1</td>
<td>3.4</td>
<td>3.4</td>
<td>3.4</td>
<td>3.3</td>
<td>3.9</td>
<td>3.9</td>
<td>4.5</td>
</tr>
<tr>
<td>Endowments/Foundations</td>
<td>6.4</td>
<td>6.9</td>
<td>7.0</td>
<td>7.3</td>
<td>7.1</td>
<td>6.7</td>
<td>7.5</td>
<td>7.5</td>
<td>6.8</td>
<td>7.3</td>
<td>8.1</td>
<td>8.7</td>
<td>9.2</td>
<td>9.7</td>
</tr>
<tr>
<td>Unions</td>
<td>5.0</td>
<td>5.8</td>
<td>6.1</td>
<td>4.9</td>
<td>4.9</td>
<td>6.0</td>
<td>6.6</td>
<td>6.7</td>
<td>7.1</td>
<td>7.4</td>
<td>7.6</td>
<td>11.6</td>
<td>11.6</td>
<td>12.5</td>
</tr>
</tbody>
</table>

• Since most institutional investors are beneath their targeted real estate allocation, real estate is likely to remain an important part of pension plan portfolios:

Current Level of Real Estate Allocations Compared to Target Allocations

- 73% Below Target
- 19% At Target
- 8% Above Target

Source: Preqin
Real Estate’s Impact on Pension Funds

• Why Commercial Real Estate?
  – Historical multi-asset returns
  – Increasing allocations to “alternatives” – including real estate
  – Large funds tend to have higher real estate allocations

• A Return to Core Real Estate
  – Traditionally, pension plans were “core” investors
  – In a reach for return, explosive growth in non-core funds
  – Then, a correction and return to core. Why?
  – Examining disappointing non-core performance.

• Private-Market Commercial Real Estate Spillover:
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• Appendices
Increasing Allocations to Non-Core Real Estate

- Public plans have aggressively rebalanced their portfolios over the last 5-10 years:
  - Went from a 75/25 mix between core and non-core real estate
  - Presently, approximately a 50/50 mix
  - Implies the majority of new investment dollars went into non-core funds

What is “Core” Real Estate?

- Core real estate are those properties, located in top-tier markets, that are built and “fully” leased in the following property types:
  - apartments,
  - industrial,
  - office,
  - retail, and
  - (perhaps?) hotels.

- Everything else is “non-core”:
  - development and extensive renovation/rehabilitation (including core property types (e.g., under-construction office building))
  - non-core property types:
    - condominiums,
    - golf course communities
    - senior-living facilities
    - student housing
    - vineyards,
    - etc.
Non-Core Real Estate = Value-Added & Opportunistic Funds

- Non-core has been “where the action is”

- Consider the explosive growth of RE-oriented private equity firms:
  - Apollo,
  - Blackstone
  - Colony Capital,
  - Colony Capital,
  - Walton Street
  - Whitehall Funds

- 2007 was a watershed year – consider the dramatic tilt in institutional investors’ allocations:
  - $44.5 billion targeted to domestic real estate
  - $36.3 billion (~80%) to private real estate
    - $24.7 billion (~70%) to non-core (i.e., value-added and opportunistic),
    - $11.6 billion (~30%) to core (i.e., stabilized apartment, industrial, office & retail)

Source: Kingsley Associates and Institutional Real Estate, Inc.
Non-Core ← Generally Higher Returns

- Non-core strategies offer higher expected returns – but with greater risk.

Illustration of Risk/Return Continuum

- Core RE
- Value-Added RE
- Development Deals
- Opportunity Funds
- Special Situations
- Non-core
Institutional Investors Searching for Higher Returns | But “Pitched” as Positive Alpha

- Investors seeking higher real estate returns (to help offset declining expected returns elsewhere in the portfolio).
- Higher $E[\text{Returns}]$ pitched as (positive) “alpha” ($\alpha$).
- However, alpha is often misunderstood/abused in practice.
- Regardless of understanding, difficult to estimate alpha *ex ante*.

Illustration of "Alpha": Risk-Adjusted Returns

![Diagram illustrating risk-adjusted returns with points for Core RE, Development Deals, Value-Added RE, and Special Situations labeled.](Diagram)
Indices of “Core” Real Estate

- **NCREIF** = National Council of Real Estate Investment Fiduciaries
  - An index of privately held, institutional U.S. core real estate
  - Approximately 6,100 properties, worth $330 billion
  - Income and appreciation returns are reported quarterly – since 1978
  - **Caveat**: appreciation returns are primarily appraisal-based

- **IPD** = Investment Property Databank
  - Serves the same purpose in other developed countries
  - However, for most countries, the time series is less than 10 years old
Then Came the Correction: 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 2009

[Graph showing trends in market values, rescaled NOI, and capitalization rates from 1978 to 2009.]

*Sources: NCREIF, BlackRock Realty and instructor's calculations.*
Real Estate Investors Return to “Core”

- A trend reversal, core funds again most popular:

Source: Prequin, Ltd.: *Real Estate Spotlight*, September 2010
Investor Preferences Observed in Transaction Volume

- Despite all the talk of “distress,” recent core acquisition activity is about twice non-core:

**2010 ALL CORE INCLUDING HOTEL ACQUISITIONS**

- Core/Stabilized
- Value-Add

<table>
<thead>
<tr>
<th>Type</th>
<th>Value (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>$7.3</td>
</tr>
<tr>
<td>Primary</td>
<td>$3.2</td>
</tr>
<tr>
<td>Secondary</td>
<td>$2.7</td>
</tr>
<tr>
<td>Tertiary</td>
<td>$1.5</td>
</tr>
</tbody>
</table>

All data 2010 YTD; in contract; all values in billions

Source: Real Capital Analytics, September 2010
The Return to Core Real Estate: Why?

- The last two (calendar) years (2008 & 2009) witnessed average fund performance of:
  
  - Core ~<35>%
  - Value-Added ~<45>%
  - Opportunistic ~<55>%

- The renewed institutional investor appetite for core real estate is due to:
  
  - Flight to quality, and
  - The disappointment with non-core returns
    - to be analyzed subsequently.

  Likely to be short-term

  Likely to be longer-term
How Should We Think about the Performance of Non-Core Real Estate?

• The opportunity for high returns is what makes these non-core deals attractive.

• How should we think about the pricing of non-core real estate funds?
  • Is the high expected return compensation for high risk (i.e., market efficiency)?
  • Or, does the high expected return represent a market inefficiency?

• The answer involves understanding:
  1. leverage and the law of one price,
  2. the nature of incentive fees (e.g., joint ventures (JVs)), and
  3. the “drag” of fees and costs.
Analysis of Risk-Adjusted Performance

- Non-core funds have under-performed (will revisit this analysis)

Volatility-Adjusted Performance by Fund Type for the 16-Year Period Ended December 31, 2008

- NPI
- Value-Added
- Core
- Opportunistic

Source: NCREIF/Townsend and authors' calculations
Levered Equity, with and without Risky Debt

Illustration of the Expected Return and Volatility of Levered Equity as Leverage Increases:
Risky vs. Riskless Debt

Notes:
(1) Debt cost is independent of leverage ratio.
(2) Debt cost is dependent upon leverage ratio.
Why Risky Debt? Lenders Need to be Compensated with Higher Expected Returns as Leverage Ratio Increases
The Law of One Price

- Two assets with the same pattern of cash flows ought to have the same price.

In practice:
- We spend a lot of time thinking about $E(k)$
- We don’t spend a lot of time thinking about $\sigma_{E(k)}$

This is a mistake!
Incentive Fees & Principal/Agent Issues: Numerical Example

• Fund-Level Return Distribution:
  • Average Return: 12.5%
  • Volatility 15.0%

• Fund Incentive Structure:
  • Ongoing fees 0.5%
  • Investor’s Preference 12.0%
  • Residual Split:
    – Investor 50%
    – Operating Partner 50%

• Notes:
  – The operating partner’s “promoted” interest creates an option-like return for operator.
  – The value of the option reduces the investor’s upside.
Think of Fund as a Joint Venture: Fund-Level Returns & Operator’s Promote

Illustration of Venture-Level Returns and Operating Partner's Participation

- Distribution of Expected Returns
- JV Participation

Likely Returns
Returns Before and After Incentive Fee (= JV Participation)

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

Estimated Frequency

Likely Returns before JV Participation

Likely Returns after JV Participation
Incentive Fees and Principal/Agent Issues: Numerical Example (continued)

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

- Notes:
  - The operating partner’s “promoted” interest reduces the investor’s net return by 300 bps:
    - Even though the value of the promote equals zero at the most likely return,
    - This is attributable to operating partner’s asymmetric participation in returns.
  - The reduction in the investor’s standard deviation is a statistical illusion:
    - The investor still receives 100% of the economic downside.
Incentive Fees and Principal/Agent Issues: Numerical Example (continued)

• A simple way to the think of the average promote:

<table>
<thead>
<tr>
<th>Probability</th>
<th>Gross Returns</th>
<th>Promote</th>
<th>Net Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>24.0%</td>
<td>6.0%</td>
<td>18.0%</td>
</tr>
<tr>
<td>50%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Average</td>
<td>12.0%</td>
<td>3.0%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

• Note: The appropriate way to calculate the expected promote:

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

where: \( \pi = \) the “promote”, \( \kappa = \) operating partner’s participation in the excess profits, \( \psi = \) investor’s preference, and \( f(x) = \) the distribution of venture-level returns, \( x \).

• Because of the operating partner’s asymmetric participation:
  – The average expectation does not equal the expectation of the average:

\[
E(\pi) = \int_{\psi}^{\infty} \kappa(x-\psi)f(x)dx \neq \kappa(\bar{x}-\psi)
\]
So, What’s Fund-Type Performance Looked Like?

Gross & Net Returns by Fund Type
for the 16-Year Period Ended December 31, 2008

Realized Gross and Net Returns

Volatility

Source: NCREIF/Townsend - Real Estate Fund Indices and Vintage Period Performance Report

Draft
How Should We Measure Performance?

- Apply the law of one price by levering up core funds:

Performance by Fund Type
for the 16-Year Period Ended December 31, 2008

Source: NCREIF/Townsend and authors' calculations
A More Refined Look

• Recall: The volatility of net returns understates the investor’s true risk exposure
Joint Ventures: Betting on Emerging Partners (continued)

- Some partners will out-perform and others will under-perform their peers
- Underperformance generally worsens with riskier strategies:

Illustration of Partner Risk as a Function of Investment Strategy
• Fee pressures on core and non-core funds alike.

• But, given the poor risk-adjusted performance of (some) value-added and opportunistic funds, institutional investors are more circumspect about future financial arrangements:

  1. preferred returns are going up,

  2. “promotes” are going down, and

  3. governance/control provisions are swinging back towards the “money” partner.
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Other Real Estate Indices Show Similar Recent Experience:

- Most indices already showed a similar correction – both commercial and residential

- The long-term premium to NAV (i.e., REIT share prices compared to private-market alternatives) ought to be positive (reflecting an illiquidity premium for private real estate).
- The public (REIT) market is widely thought to lead the private real estate market.
- The current premium to NAV may portend an increase in private-market pricing?

Source: Green Street Advisors | *Property Sector Valuation*, September 2010.
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

• The Aggressive Vintages Coming Due Later

Source: Morgan Stanley Research, “Commercial Real Estate 2010.”
CRE Loan Delinquencies by Lender Type

Delinquency Trends, by lender type

- CMBS
- Life Insurance Companies
- Fannie Mae
- Freddie Mac
- Banks and Thrifts

Source: Mortgage Bankers Association, Morgan Stanley Research

• Source: Morgan Stanley Research, “Commercial Real Estate 2010.”
CRE Loan Delinquencies by Property Type

Share of CMBS Loans in Special Servicing, by property type

Source: Trepp, Morgan Stanley Research

• Source: Morgan Stanley Research, “Commercial Real Estate 2010.”
Falling Property Markets Hurt Banks & Financial-Service Companies

- Over $42 billion in real estate-related write-downs

### Commercial Real Estate Net Writedowns

<table>
<thead>
<tr>
<th></th>
<th>4Q-07 ($Smil.)</th>
<th>1Q-08 ($Smil.)</th>
<th>2Q-08 ($Smil.)</th>
<th>3Q-08 ($Smil.)</th>
<th>4Q-08 ($Smil.)</th>
<th>1Q-09 ($Smil.)</th>
<th>2Q-09 ($Smil.)</th>
<th>3Q-09 ($Smil.)</th>
<th>4Q-09 ($Smil.)</th>
<th>TOTAL ($Smil.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lehman Brothers</td>
<td>$900.0</td>
<td>$1,000.0</td>
<td>$1,300.0</td>
<td>$1,600.0</td>
<td>$2,545.0</td>
<td>$2,545.0</td>
<td>$2,545.0</td>
<td>NR</td>
<td>NR</td>
<td>$12,435.0</td>
</tr>
<tr>
<td>Credit Suisse</td>
<td>340.0</td>
<td>850.0</td>
<td>470.0</td>
<td>900.0</td>
<td>926.0</td>
<td>1,229.0</td>
<td>283.0</td>
<td>282.0</td>
<td>64.0</td>
<td>5,344.0</td>
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<tr>
<td>Citigroup</td>
<td>NR</td>
<td>573.0</td>
<td>545.0</td>
<td>518.0</td>
<td>991.0</td>
<td>186.0</td>
<td>386.0</td>
<td>574.0</td>
<td>154.0</td>
<td>3,927.0</td>
</tr>
<tr>
<td>Bank of America</td>
<td>134.0</td>
<td>191.0</td>
<td>263.0</td>
<td>182.0</td>
<td>853.0</td>
<td>324.0</td>
<td>571.0</td>
<td>538.0</td>
<td>837.0</td>
<td>3,893.0</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>NR</td>
<td>0.0</td>
<td>375.0</td>
<td>325.0</td>
<td>700.0</td>
<td>1,325.0</td>
<td>700.0</td>
<td>200.0</td>
<td>(100.0)</td>
<td>3,525.0</td>
</tr>
<tr>
<td>Wachovia</td>
<td>1,088.0</td>
<td>521.0</td>
<td>209.0</td>
<td>347.0</td>
<td>NR</td>
<td>26.0</td>
<td>99.0</td>
<td>242.0</td>
<td>525.0</td>
<td>3,057.0</td>
</tr>
<tr>
<td>Bear Stearns/NY Fed</td>
<td>450.0</td>
<td>150.0</td>
<td>0.0</td>
<td>1,600.0</td>
<td>530.0</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>2,730.0</td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td>564.0</td>
<td>697.0</td>
<td>487.0</td>
<td>230.0</td>
<td>298.0</td>
<td>64.0</td>
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<td>Merrill Lynch</td>
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<td>954.0</td>
<td>1,131.0 (181.0)</td>
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<td>2,071.0</td>
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<td>J.P. Morgan</td>
<td>NR</td>
<td>266.0</td>
<td>190.0</td>
<td>365.0</td>
<td>723.0</td>
<td>223.0</td>
<td>(94.0)</td>
<td>(20.0)</td>
<td>(33.0)</td>
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<td>RBS</td>
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<td>41.0</td>
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<td>Morgan Stanley</td>
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<td>(500.0)</td>
<td>100.0 (200.0)</td>
<td>(200.0)</td>
<td>(400.0)</td>
<td>200.0</td>
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<tr>
<td>UBS</td>
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<td>443.0</td>
<td>(318.0)</td>
<td>(29.0)</td>
<td>NR</td>
<td>NR</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>4,191.0</strong></td>
<td><strong>3,845.0</strong></td>
<td><strong>6,692.0</strong></td>
<td><strong>8,636.0</strong></td>
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<td><strong>1,881.0</strong></td>
<td><strong>42,257.0</strong></td>
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*Figures are for global capital-markets operations, except for UBS and RBS, which show U.S. operations. Parentheses indicate net gain. NR means not reported. Writedown figures for Goldman, J.P. Morgan and Morgan Stanley are actually losses (or profits). Writedowns are estimated for Credit Suisse in 3Q-09 and 4Q-09. Writedowns by Goldman and Morgan Stanley in 1Q-08 include December 2008. Lehman's writedown in 4Q-07 is actually for full-year 2007. Some $7.6 billion of writedowns reported for Lehman from 4Q-08 to 20-09 were divided evenly. UBS transferred $8.2 billion of assets since mid-2008 to a fund owned by Switzerland's central bank without specifying the associated writedowns. Wachovia's 4Q-07 writedown includes $488 million taken in 3Q-07. Wachovia's writedowns for 3Q-09 and 4Q-09 are estimated, based upon previous proportion of writedowns by parent Wells Fargo. Exposures are for last day of quarter. Exposures are estimated for Lehman and Wachovia in 4Q-08 and J.P. Morgan in 4Q-07. Credit Suisse's exposure figures are on a gross basis. Lehman's figures include equity investments.*

Source: *Commercial Mortgage Alert*, March 26, 2010 (CMAlert.com).
Real Estate’s Impact on Pension Funds

• Why Commercial Real Estate?
  – Historical multi-asset returns
  – Increasing allocations to “alternatives” – including real estate
  – Large funds tend to have higher real estate allocations

• A Return to Core Real Estate
  – Traditionally, pension plans were “core” investors
  – In a reach for return, explosive growth in non-core funds
  – Then, a correction and return to core. Why?
  – Examining disappointing non-core performance.

• Private-Market Commercial Real Estate Spillover:
  – Public Real Estate Equities
  – Commercial Real Estate Lending

• Feedback System: Housing ↔ Commercial Real Estate

• Conclusions

• Appendices
Other Real Estate Indices Show Similar Recent Experience:

- Most indices already showed a similar correction – both commercial and residential.

The Residential Real Estate Channel

- The rise and fall in home price [and (pro-cyclical) volume] contributes to the current strain on state and local budgets.
- In order to cope, state & local authorities consider a range of service cuts &/or tax increases ← adversely affects commercial real estate values

Source: Robert Shiller - *Irrational Exuberance*
The 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 2009

Net Annual Appreciation Rate of 4%

Net Annual Appreciation Rate of 2.53%

Net Annual Appreciation Rate of 0%

Total Price Decline from Peak Prices

Bubble Growth: Maximum Price Increase from January, 2000

Source: S&P/Case-Shiller and instructor's calculations.
Real Estate’s Impact on Pension Funds

• Why Commercial Real Estate?
  – Historical multi-asset returns
  – Increasing allocations to “alternatives” – including real estate
  – Large funds tend to have higher real estate allocations

• A Return to Core Real Estate
  – Traditionally, pension plans were “core” investors
  – In a reach for return, explosive growth in non-core funds
  – Then, a correction and return to core. Why?
  – Examining disappointing non-core performance.

• Private-Market Commercial Real Estate Spillover:
  – Public Real Estate Equities
  – Commercial Real Estate Lending

• Feedback System: Housing ↔ Commercial Real Estate

• Conclusions

• Appendices
Some Concluding Thoughts

• Substantial losses (35 → 55%, on average) in 2008 & 2009.

• The previous enthusiasm for value-added and opportunistic funds has subsided with the “correction” in real estate prices.

• As in most any market downturn, there has been a flight to quality.

• However, institutional investors have also been disappointed by the long-term, risk-adjusted performance of their investments in value-added and opportunistic funds.

• The problems of the private commercial real estate market are also found in allied areas:
  1. publicly traded REITs (prices may portend a rebound in private-market valuations), and
  2. commercial real estate lending market (though the most aggressively underwritten loans generally don’t mature for several years | can current debt-service obligations be met?)

• A feedback loop to the residential market:
  1. those municipalities with financial difficulties represent additional risks to commercial property owners,
     a) cuts in services, and/or
     b) increases in property-related taxes,
  2. falling commercial prices may contribute to municipality’s woes.
Real Estate’s Impact on Pension Funds: Appendices

1. Conventional Arguments for Real Estate’s Inclusion in the Institutional Mixed-Asset Portfolio

2. Public Plans’ Historical Portfolio Allocations

3. Annual (Gross & Net) Returns by Fund Strategy

4. Additional Thoughts on Incentive Fees

5. Property-Market Fundamentals

6. Capital-Market Activities
Appendix #1:
Conventional Arguments for Real Estate’s Inclusion in the Institutional Mixed-Asset Portfolio
Appendix: Mixed-Asset Portfolio’s Efficient Frontier

Without making any adjustment to the volatility of the appraisal-based NCREIF returns, the “efficient frontier” based on 1978-2009 looks like:

Efficient Frontier and Selected Asset Classes
for the Thirtytwo-Year Period 1978-2009

Source: Morningstar & author’s calculations.
Appendix: Mixed-Asset Portfolio’s Efficient Frontier

- Efficient frontier with and without (commercial) real estate, based on 1978-2009:

Efficient Frontiers with and without Real Estate
Selected Asset Classes for the Thirtytwo-Year Period 1978-2009

Source: Morningstar & author’s calculations.
Appendix: Mixed-Asset Portfolio’s Efficient Frontier

Risk-reduction characteristics with (commercial) real estate, based on 1978-2009:

Efficient Frontiers with and without Real Estate
Selected Asset Classes for the Thirtytwo-Year Period 1978-2009
An Illustration of Risk Reduction

Source: Morningstar & author’s calculations.
Appendix: Mixed-Asset Portfolio’s Efficient Frontier

Return-enhancement characteristics with (commercial) real estate, based on 1978-2009:

Efficient Frontiers with and without Real Estate
Selected Asset Classes for the Thirtyone-Year Period 1978-2008
An Illustration of Return Enhancement

Source: Morningstar & author’s calculations.
Appendix: Mixed-Asset Portfolio’s Efficient Frontier

Private and public real estate occupy a significant percentage of the efficient frontier:

Components of the (Unconstrained) Efficient Frontier
for the Thirtytwo-Year Period 1978-2008

Source: Morningstar & author’s calculations.
Appendix #2:
Public Pension Plans’ Historical Portfolio Allocations
As noted earlier, the increased real estate allocation came at the expense of the cash and bond allocations.

### Exhibit A.2
All Public Plan Sponsors—Sample Group

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<th></th>
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<tbody>
<tr>
<td><strong>Cash</strong></td>
<td>5.5</td>
<td>5.3</td>
<td>5.2</td>
<td>4.2</td>
<td>4.1</td>
<td>3.8</td>
<td>3.5</td>
<td>3.4</td>
<td>3.2</td>
<td>2.7</td>
<td>3.1</td>
<td>2.9</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Stocks</strong></td>
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<td>Equities (unspecified)</td>
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<td>15.1</td>
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<td>8.8</td>
<td>6.4</td>
<td>6.0</td>
<td>4.6</td>
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<td>U.S. Indexed Equities</td>
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<td>14.9</td>
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<td>13.1</td>
<td>6.7</td>
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<tr>
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<td>0.1</td>
<td>0.2</td>
<td>0.8</td>
<td>1.1</td>
<td>1.8</td>
<td>1.5</td>
<td>2.1</td>
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<td>5.2</td>
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<td><strong>Bonds</strong></td>
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<td></td>
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<td>Bonds (other)</td>
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<td>20.0</td>
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<td>18.9</td>
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<td>4.3</td>
<td>4.9</td>
<td>5.2</td>
<td>7.4</td>
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<td>2.4</td>
<td>1.4</td>
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<td>0.3</td>
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<td>0.7</td>
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<td>2.0</td>
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<td>1.7</td>
<td>1.5</td>
<td>0.9</td>
<td>0.8</td>
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<td>2.8</td>
<td>2.9</td>
<td>1.3</td>
<td>3.2</td>
<td>3.9</td>
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<td><strong>Real Estate Equity</strong></td>
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<td>0.9</td>
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<td>0.3</td>
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<td>0.3</td>
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<td>4.8</td>
<td>5.4</td>
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<td>6.8</td>
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<td>100.0</td>
<td>100.0</td>
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</table>

Appendix #3: Annual (Gross & Net) Returns by Fund Strategies
Appendix: Annual Gross & Net Returns by Fund Strategy

- Performance by strategy over a full cycle?
- Performance over 2008 & 2009: -35% → -55%

NCIREIF/Townsend - Real Estate Fund Indices and Vintage Report
for the Period 1989 through 2009

<table>
<thead>
<tr>
<th>Year Ended</th>
<th>Gross (Value-Weighted) Returns</th>
<th>Net (Value-Weighted) Returns</th>
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<tbody>
<tr>
<td></td>
<td>Core NFT All Op-End</td>
<td>NFT All Closed-OPCE</td>
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<tr>
<td>2009</td>
<td>-16.86% -29.75% -29.76%</td>
<td>-40.66% -34.86% -29.87%</td>
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<tr>
<td>2008</td>
<td>-6.46% -9.99% -10.01%</td>
<td>-19.38% -19.52% -36.10%</td>
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<tr>
<td>2007</td>
<td>15.84% 15.92% 15.97%</td>
<td>17.38% 17.50% 26.03%</td>
</tr>
<tr>
<td>2006</td>
<td>16.59% 16.46% 16.32%</td>
<td>19.45% 20.03% 43.01%</td>
</tr>
<tr>
<td>2005</td>
<td>20.06% 21.18% 21.39%</td>
<td>27.53% 30.42% 44.47%</td>
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<tr>
<td>2004</td>
<td>14.48% 13.68% 13.06%</td>
<td>17.84% 18.70% 29.68%</td>
</tr>
<tr>
<td>2003</td>
<td>8.99% 9.45% 9.28%</td>
<td>11.61% 12.47% 16.39%</td>
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<tr>
<td>2002</td>
<td>6.74% 5.87% 5.54%</td>
<td>4.82% 3.82% 5.93%</td>
</tr>
<tr>
<td>2001</td>
<td>7.28% 5.63% 5.64%</td>
<td>9.02% 9.09% 5.85%</td>
</tr>
<tr>
<td>2000</td>
<td>12.24% 13.57% 14.28%</td>
<td>14.26% 14.98% 18.54%</td>
</tr>
<tr>
<td>1999</td>
<td>11.36% 12.35% 13.17%</td>
<td>12.17% 11.10% 11.61%</td>
</tr>
<tr>
<td>1998</td>
<td>16.24% 15.89% 16.42%</td>
<td>10.00% 10.92% 19.89%</td>
</tr>
<tr>
<td>1997</td>
<td>13.91% 15.52% 15.11%</td>
<td>22.07% 19.67% 29.87%</td>
</tr>
<tr>
<td>1996</td>
<td>10.31% 10.02% 11.71%</td>
<td>12.89% 12.90% 23.28%</td>
</tr>
<tr>
<td>1995</td>
<td>7.54% 6.10% 7.11%</td>
<td>11.22% 12.01% 17.71%</td>
</tr>
<tr>
<td>1994</td>
<td>6.39% 5.99% 6.14%</td>
<td>8.65% 10.09% 16.68%</td>
</tr>
<tr>
<td>1993</td>
<td>1.38% 2.43% 1.76% 0.55%</td>
<td>-0.30% -0.55% -8.06%</td>
</tr>
<tr>
<td>1992</td>
<td>-4.26% -4.89% -4.32% -5.49%</td>
<td>-11.17% -11.84% -11.80%</td>
</tr>
<tr>
<td>1991</td>
<td>-5.59% -7.40% -6.53% -6.24%</td>
<td>-4.44% -2.91% -10.81%</td>
</tr>
<tr>
<td>1990</td>
<td>2.30% 1.25% 0.40% 1.41%</td>
<td>-0.15% 5.31% 0.56%</td>
</tr>
<tr>
<td>1989</td>
<td>7.77% 7.48% 6.98% 6.71%</td>
<td>8.72% 11.44% 5.99%</td>
</tr>
</tbody>
</table>

Market Downturn
2008-09 -22.23% -36.77% -36.77% -36.79% -52.16% -47.57% -55.19% -37.62% -37.62% -37.84% -53.18% -48.51% -56.01%
Appendix #4: Additional Thoughts on Incentive Fees
### Appendix: Tradeoff – Preference v. Promote

- **Assuming venture-level performance is unchanged, what’s the tradeoff between the preferred return & promote?**

<table>
<thead>
<tr>
<th>Base Case</th>
<th>Sensitivity of Preference &amp; Promote Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JV Deal before Operating Partner:</strong></td>
<td></td>
</tr>
<tr>
<td>Average Return ($\mu_V$)</td>
<td>12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0%</td>
</tr>
<tr>
<td>Standard Deviation ($\sigma_V$)</td>
<td>15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0% 15.0%</td>
</tr>
<tr>
<td>Investor's Preference ($\psi$)</td>
<td>12.0% 11.0% 10.0% 9.0% 8.0% 7.0% 6.0% 5.0% 4.0% 3.0% 2.0% 1.0% 0.0%</td>
</tr>
<tr>
<td>Residual Splits:</td>
<td></td>
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<tr>
<td>Investor</td>
<td>12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0%</td>
</tr>
<tr>
<td>Operator (Promote = $\kappa$)</td>
<td>12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0% 12.0%</td>
</tr>
</tbody>
</table>

| **JV Deal after Operating Partner:** | |
| Likely Returns: | |
| **JV Deal before Operating Partner:** | |
| Operating Partner's Participation | 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% 3.0% |
| Investor's Net Return | 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% 9.0% |

| Volatility (Standard Deviation): | |
| **JV Deal before Operating Partner:** | |
| Operating Partner's Participation | 3.1% 2.9% 2.8% 2.6% 2.4% 2.3% 2.2% 2.1% 2.0% 1.9% 1.8% 1.8% 1.7% |
| Investor's Net Return | 11.9% 12.1% 12.2% 12.4% 12.6% 12.7% 12.8% 12.9% 13.0% 13.1% 13.2% 13.2% 13.3% |
• For an equivalent operating partner’s expected promote, here’s the tradeoff between the preferred return and the promote.
Tradeoff: Preference v. Promote – Some Thoughts

- The previous two slides suggest that the operating partner can earn the same expected promote – with less risk – by reducing its promote in return for the investor reducing its preferred return.

- In the extreme (and given our assumptions), the operating partner ought to be willing to reduce its promote to 20% provided the investor eliminates its preferred return:
  - Looks a lot like the private equity model

- Endogeneity problem: Operating partner’s effort level is related to the probability of realizing the promote.

- This endogeneity problem argues – all else being equal – for a lower preference and a lower promote; so that the operating partner expends more effort and, hence, the venture earns a larger (risk-adjusted) return.

- In addition to effort, the venture-level performance is influenced by the property type and the skill of the operating partner.
Appendix: Effort = f (Expected Promote > 0)

- But, the operating partner’s effort should be a function of the probability that the expected promote will be greater than zero (or realized).
Appendix: Venture Performance = f (Effort)

- In turn, the venture’s performance is a function of the operating partner’s effort.

Illustration of Forecasted Core Real Estate Returns with Leverage

- Market Opportunity Set (Core with Leverage)
- Maximum Effort
- Venture-Specific Performance
- Minimum Effort

Volatility of Expected Return (σₑ)

Expected Gross Return (kₑ)
Appendix #5:
Property-Market Fundamentals
Vacancy rates are high (relative to 2007) across all property types.

Many institutional investors are predicting a return to near-2007 levels.

Construction of new supply is negligible.

So, how long before demand growth fills the void? \[= f(\text{nature of economic recovery})\]

### US Vacancy Rates by Property Type

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>5.7%</td>
<td>6.8%</td>
<td>8.1%</td>
<td>8.5%</td>
<td>7.8%</td>
<td>6.6%</td>
<td>5.6%</td>
<td>5.5%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Industrial</td>
<td>9.5%</td>
<td>11.4%</td>
<td>13.9%</td>
<td>14.2%</td>
<td>13.4%</td>
<td>12.0%</td>
<td>10.8%</td>
<td>10.2%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Office</td>
<td>12.6%</td>
<td>14.0%</td>
<td>16.3%</td>
<td>17.2%</td>
<td>16.7%</td>
<td>15.3%</td>
<td>13.7%</td>
<td>12.5%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Retail</td>
<td>7.2%</td>
<td>8.7%</td>
<td>10.3%</td>
<td>10.7%</td>
<td>10.4%</td>
<td>9.8%</td>
<td>9.1%</td>
<td>8.6%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>

Source: CBRE-EA, REIS (History), RREEF Research (Forecast), as of August 2010
Appendix: Real Path of NCREIF Market Values, Incomes & Cap Rates

Sources: NCREIF, BlackRock Realty and instructor's calculations.
Appendix: “Distressed” Sales

- Spike in hotel distress is startling
- In all but apartments, distress sales seem to be declining/stabilizing:

Source: Real Capital Analytics | *U.S. Capital Trends*, July 2010
Appendix #6:
Capital-Market Activities
• Real Estate funds still popular:

Source: Preqin, Ltd.: Q3 2010 Private Equity Fundraising Update
## Appendix: Capital-Raising Efforts – Private Equity

- In 2010 (YTD), approximately $20 billion already raised by the top ten funds:

<table>
<thead>
<tr>
<th>Fund</th>
<th>Firm</th>
<th>Capital Raised (mn)</th>
<th>Fund Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Estate Turnaround Consortium</td>
<td>Brookfield Asset Management</td>
<td>5,565 USD</td>
<td>Global</td>
</tr>
<tr>
<td>Morgan Stanley Real Estate Fund VII Global</td>
<td>Morgan Stanley Real Estate</td>
<td>4,700 USD</td>
<td>Global</td>
</tr>
<tr>
<td>Fortress Credit Opportunities Fund II</td>
<td>Fortress Investment Group</td>
<td>2,600 USD</td>
<td>Global</td>
</tr>
<tr>
<td>Beacon Capital Strategic Partners VI</td>
<td>Beacon Capital Partners</td>
<td>2,500 USD</td>
<td>US, West Europe</td>
</tr>
<tr>
<td>Starwood Global Opportunity Fund VIII</td>
<td>Starwood Capital Group</td>
<td>1,800 USD</td>
<td>Global</td>
</tr>
<tr>
<td>Starwood Capital Global Hospitality Fund II</td>
<td>Starwood Capital Group</td>
<td>965 USD</td>
<td>Global</td>
</tr>
<tr>
<td>Fortress Japan Opportunity Fund</td>
<td>Fortress Investment Group</td>
<td>75,000 JPY</td>
<td>Japan</td>
</tr>
<tr>
<td>Mesa West Real Estate Income Fund II</td>
<td>Mesa West Capital</td>
<td>615 USD</td>
<td>Western US</td>
</tr>
<tr>
<td>JBG Fund VII</td>
<td>JBG Companies</td>
<td>577 USD</td>
<td>Washington D.C.</td>
</tr>
<tr>
<td>AEW Partners VI</td>
<td>AEW Capital Management</td>
<td>575 USD</td>
<td>North America</td>
</tr>
</tbody>
</table>

Source: Preqin Real Estate Spotlight, September 2010.
In 3rd quarter of 2010, another ~$20 billion for real estate is “on the road” by the top ten funds:

<table>
<thead>
<tr>
<th>Fund</th>
<th>Manager</th>
<th>Target Size (mn)</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lone Star Fund VII</td>
<td>Lone Star Funds</td>
<td>4,000 USD</td>
<td>Debt and Distressed</td>
</tr>
<tr>
<td>Lone Star Real Estate Fund II</td>
<td>Lone Star Funds</td>
<td>4,000 USD</td>
<td>Debt, Distressed and Opportunistic</td>
</tr>
<tr>
<td>Carlyle Realty Partners VI</td>
<td>Carlyle Group</td>
<td>3,000 USD</td>
<td>Debt and Opportunistic</td>
</tr>
<tr>
<td>TA Realty Associates IX</td>
<td>TA Associates Realty</td>
<td>1,850 USD</td>
<td>Core-Plus, Debt, Distressed and Value Added</td>
</tr>
<tr>
<td>MacFarlane Urban Real Estate Fund III</td>
<td>MacFarlane Partners</td>
<td>1,500 USD</td>
<td>Opportunistic</td>
</tr>
<tr>
<td>UK Property Income Fund</td>
<td>Legal &amp; General Property</td>
<td>700 GBP</td>
<td>Core and Core-Plus</td>
</tr>
<tr>
<td>Aetos Capital Asia IV</td>
<td>Aetos Capital Asia</td>
<td>1,000 USD</td>
<td>Debt, Distressed and Opportunistic</td>
</tr>
<tr>
<td>Forum Asian Realty Income III</td>
<td>Forum Partners</td>
<td>1,000 USD</td>
<td>Opportunistic</td>
</tr>
<tr>
<td>Vornado Capital Partners</td>
<td>Vornado Realty Trust</td>
<td>1,000 USD</td>
<td>Distressed and Value Added</td>
</tr>
</tbody>
</table>

Source: Preqlin Real Estate Spotlight, September 2010.
Appendix: Capital-Raising Efforts – Public

- Fund-raising began in second half of 2008
- And has continued into 2010
- Equity initially dominated capital-raising (~3:1), but now < 2:1:

<table>
<thead>
<tr>
<th></th>
<th>Common Stock</th>
<th>Senior Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>Issues</td>
<td>Size</td>
</tr>
<tr>
<td>Second Half of 2008</td>
<td>45</td>
<td>$8,248,820</td>
</tr>
<tr>
<td>Number of Offerings</td>
<td></td>
<td>$183,307</td>
</tr>
<tr>
<td>Amount Raised ($000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Raise per Offering ($000)</td>
<td>$208,700</td>
<td>$208,700</td>
</tr>
</tbody>
</table>

2009

<table>
<thead>
<tr>
<th></th>
<th>Common Stock</th>
<th>Senior Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>Issues</td>
<td>Size</td>
</tr>
<tr>
<td>Number of Offerings</td>
<td>190</td>
<td>23,755,138</td>
</tr>
<tr>
<td>Amount Raised ($000)</td>
<td></td>
<td>125,027</td>
</tr>
<tr>
<td>Average Raise per Offering</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

First Half of 2010:

<table>
<thead>
<tr>
<th></th>
<th>Common Stock</th>
<th>Senior Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>Issues</td>
<td>Size</td>
</tr>
<tr>
<td>Number of Offerings</td>
<td>34</td>
<td>9,768,339</td>
</tr>
<tr>
<td>Amount Raised ($000)</td>
<td></td>
<td>116,290</td>
</tr>
<tr>
<td>Average Raise per Offering</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total:

<table>
<thead>
<tr>
<th></th>
<th>Common Stock</th>
<th>Senior Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>Issues</td>
<td>Size</td>
</tr>
<tr>
<td>Number of Offerings</td>
<td>319</td>
<td>$41,772,357</td>
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<tr>
<td>Amount Raised ($000)</td>
<td></td>
<td>$1</td>
</tr>
<tr>
<td>Average Raise per Offering</td>
<td></td>
<td>64.5%</td>
</tr>
</tbody>
</table>

Source: SNL Financial and instructor's calculations
Appendix: Dry Powder – Private Equity

- More “dry powder” than ever before.
- Lots of talk about “opportunistic/distressed situations”
- But, so far, more smoke than fire!

### Private Equity Real Estate Dry Powder by Fund Strategy: 2002 - 2009

<table>
<thead>
<tr>
<th></th>
<th>Core-Plus</th>
<th>Opportunistic</th>
<th>Value Added</th>
<th>Debt</th>
<th>Distressed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec-2002</td>
<td>2.1</td>
<td>19.7</td>
<td>10.0</td>
<td>5.1</td>
<td>1.3</td>
<td>38.1</td>
</tr>
<tr>
<td>Dec-2003</td>
<td>3.1</td>
<td>16.8</td>
<td>11.1</td>
<td>4.6</td>
<td>1.5</td>
<td>37.1</td>
</tr>
<tr>
<td>Dec-2004</td>
<td>4.7</td>
<td>20.4</td>
<td>18.3</td>
<td>5.7</td>
<td>0.9</td>
<td>50.0</td>
</tr>
<tr>
<td>Dec-2005</td>
<td>7.9</td>
<td>43.7</td>
<td>31.1</td>
<td>6.9</td>
<td>3.4</td>
<td>93.0</td>
</tr>
<tr>
<td>Dec-2006</td>
<td>10.9</td>
<td>60.9</td>
<td>40.9</td>
<td>9.2</td>
<td>4.5</td>
<td>126.4</td>
</tr>
<tr>
<td>Dec-2007</td>
<td>10.2</td>
<td>84.5</td>
<td>50.2</td>
<td>16.4</td>
<td>4.6</td>
<td>165.9</td>
</tr>
<tr>
<td>Dec-2008</td>
<td>8.7</td>
<td>84.0</td>
<td>48.0</td>
<td>24.7</td>
<td>5.8</td>
<td>171.2</td>
</tr>
<tr>
<td>Dec-2009</td>
<td>8.9</td>
<td>86.7</td>
<td>58.6</td>
<td>21.0</td>
<td>9.3</td>
<td>184.5</td>
</tr>
</tbody>
</table>

*Source: Preqin Ltd. (www/preqin.com) and author’s calculations.*