

Public versus Private Commercial Real Estate Returns: MSA Allocations, Property Selection, and Performance Attribution

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Background & Motivation

- Investors can own commercial RE through
 - Private investment vehicles (directly, LLCs, private equity funds, etc.)
or
 - Public RE securities (REITs)
- Returns in both markets should be driven...at least in long-run...by the cash flows produced by underlying properties
- Nevertheless...public & private RE returns often exhibit significantly different risk-return characteristics
 - Public & private RE returns display limited correlation over quarterly & annual horizons
 - In contrast, equity REITs & small-cap value stocks are highly correlated

Why Differences in Risk–Return Performance?

- Several factors may cause REIT prices to move differently than MV of underlying properties...especially in the short-run
 - Leverage (amplifies returns)
 - Δ 's in market value of liquidity and/or transparency
 - Δ 's in general stock market & RE "sentiment" (non-rational expectations)
 - Potential integration, location, and selection effects
- Understanding the difference in return performance is important

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We Examine Public versus Private Commercial Real Estate Return Performance

- **Research Agenda:**
 - Our first paper examines returns and information transmission dynamics in US public and private real estate markets (REE, forthcoming)
 - Employ a two-stage approach:
 - (1) Compare performance after adjusting the composition & risk characteristics of REITs to match our private return series
 - (2) Use vector autoregression (VAR) techniques to examine the return dynamics and information transmission between public & private RE returns
 - Our current work in progress examines the effects of geographic concentration of RE holdings on US public and private RE market return performance differences
 - (1) Assess performance after adjusting for geographic concentration of properties
 - (2) Attribution analysis to decompose performance into allocation, selection, and interactive effects

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Some Evidence on Public vs Private CRE Return Performance and Geographic Effects

- Some recent studies find that investments in direct private RE produced lower average returns, even after controlling for differences in financial leverage, property mix, and management fees:
 - Pagliari et al. (2005); Riddiough et al. (2005); and Tsai (2007)
- Other studies within REITs provide evidence suggesting that geographic allocations affect value
 - Capozza and Seguin (1999); Hartzell, Sun and Titman (2014)

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Preview of Results

- **We find:**
 - Adjusting for differences between public and private markets in financial leverage, property type focus, and management fees, **passive portfolios of unlevered core REITs outperformed their private market benchmark by 49 basis points (annualized)** over the 1994-2012 sample period
 - Our baseline bivariate VAR results without asset pricing controls suggest **REIT returns possess information on future private market returns, but this effect is eliminated with asset pricing controls**
 - We **document significant differences in geographic allocations of property portfolios between public and private markets**, including over time and across property types
 - **Adjusting private markets for differences in geographic concentrations with public markets, we find that core private market performance falls**
 - Our attribution analysis shows that **property selection within MSA allocation is important**

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Empirical Strategy

First Part:

- Non-parametric approach -- comparing public & private RE returns directly requires several adjustments:
 - Remove effects of leverage from firm-level REIT returns
 - Exclude REITs that do not invest in “core” property types
 - Use same property-type weights as found in benchmark private market index to create our aggregate REIT index, and
 - Adjust downward returns earned on our benchmark private RE index for management expenses
 - Private (NCREIF) returns are reported gross of management fees;
 - REIT returns are reported net of all firm-level management expenses
- Bivariate VAR public and private RE return regressions with and without standard asset pricing controls

Second Part:

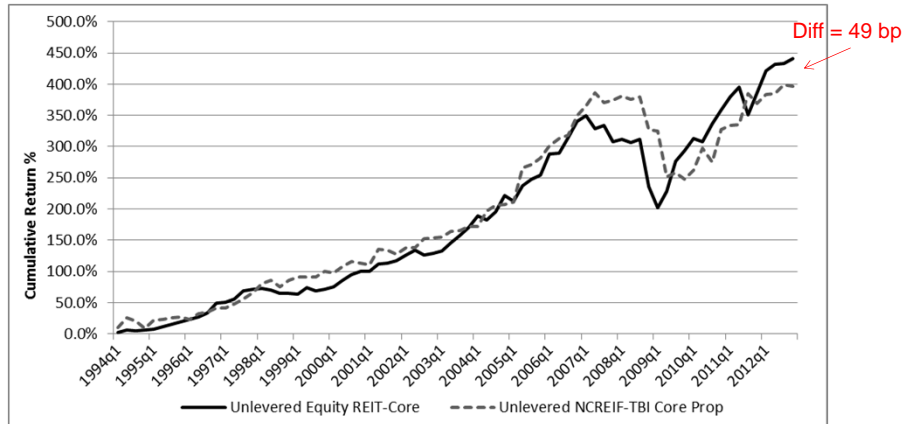
- Geographic concentration adjustments
- Attribution analysis

Data

- **Benchmark Public Market Returns: REIT Data**
 - From *CRSP-Ziman database* for each REIT at beginning of each quarter: total returns, property & sub-property type focus, equity market capitalization, ...
 - Accounting information needed to unlever returns at firm level is obtained from *Compustat database*
 - *SNL Real Estate database* for property level info: owner (institution name), property type, geographic location (MSA), acquisition date, sold date, book value, initial cost, and historic cost (back to 1996)
- **Benchmark Private Market Returns: NCREIF TBI & NPI Data**
 - NCREIF Transaction Based Index (TBI) available at national level back to 1994:Q1 for the 4 core property types: multifamily, office, industrial, and retail
 - NCREIF Property Index (NPI) available at *MSA level* for the 4 core property types: multifamily, office, industrial, and retail

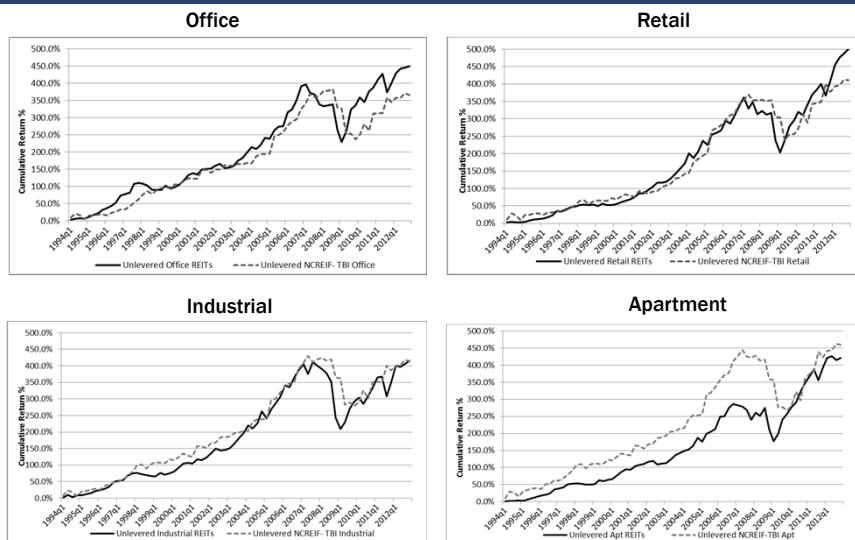
Public Market Core Real Estate Returns outperform Private Market Returns

Cumulative Unlevered Returns on Core-Properties: REITs vs. NCREIF TBI



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Public Market Office & Retail Outperform, Industrial Performs Similarly, and Apartments Underperform



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Public Real Estate Market Returns Lead Private: Dynamic Return Relation between Core Public and Private Returns (excluding asset pricing controls)

- Bivariate VAR model:

$$Y_t = \mu + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_k Y_{t-p} + e_t,$$

where Y_t is a $k \times 1$ vector of endogenous variables, μ is a $k \times 1$ vector of intercepts, $\Phi_1, \Phi_2, \dots, \Phi_k$ are $k \times k$ matrices of parameters with all eigenvalues of Φ having moduli less than one so that the VAR is stationary. e_t is a vector of uncorrelated structural shocks [$\sim NID(0, \Omega)$].

Joint Significance

Variables	Core-Properties	
	REITRET	TBIRET
REITRET _{t-1 to t-4}	0.182 (0.555)	1.221*** (0.000)
TBIRET _{t-1 to t-4}	-0.202 (0.595)	-0.322*** (0.000)

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By Property Types, Public Market Returns also Lead Private Market Returns (excluding asset pricing controls)

- Bivariate VAR Model by Property Types (joint significance):

Variables	Apartment		Industrial	
	REITRET	TBIRET	REITRET	TBIRET
REITRET _{t-1 to t-4}	-0.058 (0.848)	1.251*** (0.000)	-0.009 (0.321)	1.103*** (0.000)
TBIRET _{t-1 to t-4}	-0.051 (0.577)	-0.210*** (0.002)	0.199 (0.538)	-0.532*** (0.000)

Variables	Office		Retail	
	REITRET	TBIRET	REITRET	TBIRET
REITRET _{t-1 to t-4}	0.333 (0.283)	0.906*** (0.000)	-0.022 (0.960)	1.211*** (0.000)
TBIRET _{t-1 to t-4}	-0.443 (0.204)	0.031*** (0.001)	0.118 (0.757)	-0.373*** (0.001)

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Omitted Fundamental Variables are the Source of Information Transmission from Public to Private Market Returns

- The ability of REITs to predict TBI returns is largely due to omitted fundamental variables that are correlated with TBI returns
 - REIT returns are not predicting private market returns; rather, fundamentals are predicting both REIT & private market returns
 - But changing fundamentals are more quickly incorporated into liquid REIT prices

Specification includes	Core-Properties	
	<i>REITRET</i>	<i>TBIRET</i>
Controls		
$REITRET_{t-1 \text{ to } t-4}$	0.298 (0.908)	0.421 (0.341)
$TBIRET_{t-1 \text{ to } t-4}$	-0.005 (0.592)	-0.731*** (0.000)

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REITs are not Embedding Real Estate Specific Information in Predicting Private Market Returns

- After adding fundamental economic control variables...
 - Lagged REIT returns are not predictive of TBI returns
 - Exception: Apartments
- Suggests no additional predictive power in REIT returns beyond standard asset pricing control variables
- Explanation: REITs are not embedding real estate specific information

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Does adjusting for geographic concentration affect the measured relative performance?

- We first assess if there are differences in geographic allocations and examine the extent to which geographic concentrations of properties held affect performance outcomes
- We then attribute the source of the relative performance into:
 - Market (MSA) allocation
 - Individual property selection within (MSA) markets
 - Or some combination of the two

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Measuring Geographic Concentrations

- Collect the following data from SNL on an annual basis for each property held by an equity REIT during 1996-2013:
 - property owner (institution name)
 - property type
 - geographic location (MSA)
 - acquisition date
 - sold date
 - book value
 - initial cost, and
 - historic cost
- Over 500,000 property year observations in our dataset over our sample period
 - At the beginning of 1996, equity REITs held 15,752 properties with a reported book value of over \$34 billion.
 - By 2013, equity REITs owned 32,707 properties with a reported book value of over \$419 billion.

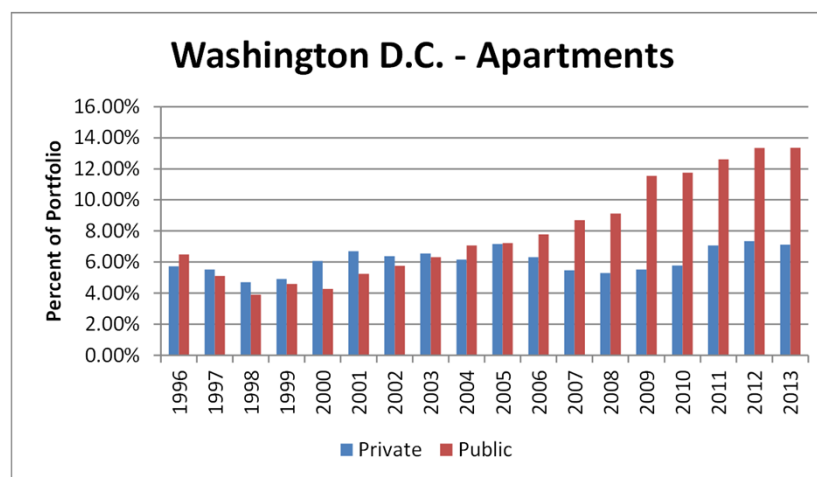
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Measuring Geographic Concentrations

- Sort each property held by a REIT--and its book value--into an MSA
 - Book value: historical cost of property & improvements minus accumulated depreciation
- Do this separately for all 4 core property types
- Example: Apartments
 - Compute % of book value of apartments owned by apartment REITs in each MSA at beginning of each year

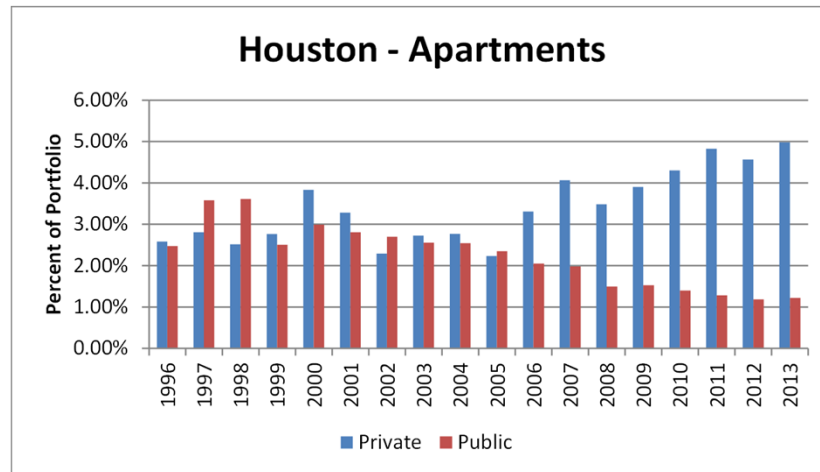
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REIT vs. NCREIF Apartment Allocations



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REIT vs. NCREIF Apartment Allocations



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What (Else) Do We Do With Geography?

- Also calculate MSA concentrations of REIT-owned apartments based on (2) # of properties & (3) “adjusted cost” of each property
 - SNL adjusted cost: max of book value, initial cost, and historic cost
- Also do “gateway” cities

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So...How Does This Reweighting Affect NPI Returns: 1996-2013?

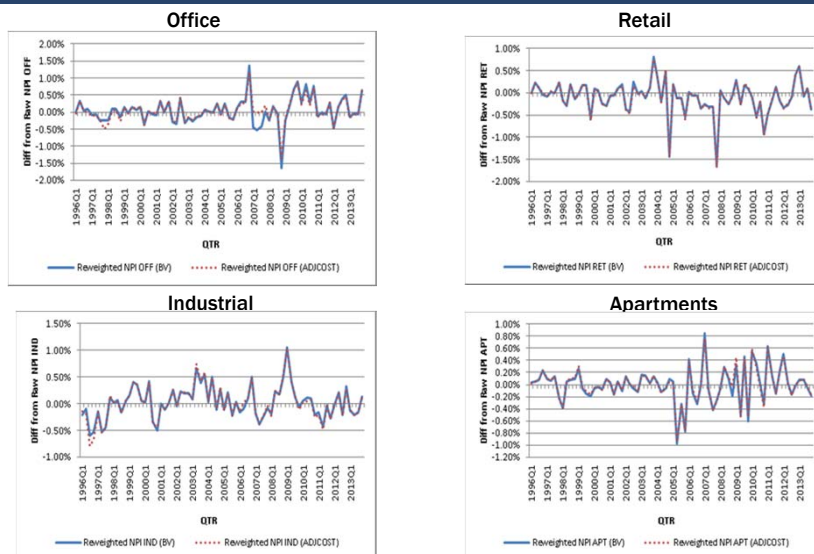
- On aggregate (i.e., Core Properties), NPI return performance becomes worse by 1.7-2.4 basis points per quarter
- However, there are cross-property differences in this return effect (Apartments *flat*; Industrial and Office *positive*; Retail *negative*)

Average of Reweighted NPI Returns minus Unadjusted NPI Returns (1996-2013)

	Using Book Value	Using Adjusted Cost
Apartment	-0.002	0.000
Industrial	0.025	0.019
Office	0.038	0.044
Retail	-0.100	-0.106
Core Properties	-0.024	-0.017

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Differences in Reweighted NPI and Raw NPI Returns can be Large Overtime and across Property Types



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Attributing the Relative Public vs Private Return Performance

We attribute the source of the relative public versus private market return performance into market (MSA) allocation, individual property selection within (MSA) markets, and some combination of the two:

$$R_{f,t}^{REIT} - R_{f,t}^{NPI} = \text{allocation} + \text{selection} + \text{interaction}$$

f is property type in year t,

allocation is the portion of the return differential due to differences in MSA allocations:

$$A_{f,t}^{REIT} - A_{f,t}^{NPI} = r_{m=1}^{NPI}(w_{m=1}^{REIT} - w_{m=1}^{NPI}) + r_{m=2}^{NPI}(w_{m=2}^{REIT} - w_{m=2}^{NPI}) + r_{m=3}^{NPI}(w_{m=3}^{REIT} - w_{m=3}^{NPI}) + \dots + r_{m=n}^{NPI}(w_{m=n}^{REIT} - w_{m=n}^{NPI})$$

selection is the portion of the return differential due to property selection within MSA allocations:

$$S_{f,t}^{REIT} - S_{f,t}^{NPI} = w_{m=1}^{NPI}(r_{m=1}^{REIT} - r_{m=1}^{NPI}) + w_{m=2}^{NPI}(r_{m=2}^{REIT} - r_{m=2}^{NPI}) + w_{m=3}^{NPI}(r_{m=3}^{REIT} - r_{m=3}^{NPI}) + \dots + w_{m=n}^{NPI}(r_{m=n}^{REIT} - r_{m=n}^{NPI})$$

interaction is the portion of the return differential that resulted from the synergy between allocation and selection decisions.

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Core Properties (Aggregate) Attribution Results

- Attribution Analysis using NPI as Benchmark

Core Properties (Aggregate)	1996-2013
Unlevered REIT return minus raw NPI	0.054
Pure allocation effect	-0.019
Selection effect plus interaction	0.074

Adjusted REITs outperformed Private Markets by 5.4 bp per quarter.

The outperformance came from property selection (7.4 bp), whereas REITs underperformed on MSA allocation (-1.9 bp)

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Additional Tests Confirm Our Core Findings

- The reported results are robust to different asset pricing specifications, gateway versus non-gateway locations, alternative weight definitions, ...

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Some Key Takeaways

- We show that there are differences in public versus private commercial real estate return performance
- REIT returns react to fundamental asset pricing information more quickly than private market returns, but do not appear to embed additional CRE specific information useful in predicting private market returns
- There are significant differences in geographic allocations of property portfolios between public and private markets and these differences have performance effects
- Our attribution analysis shows that property selection within MSA allocation is important
- Taken together, our results suggest that additional follow-on research examining RE geographic allocation and selection effects is important to understanding return performance and effective investment strategies

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Some Recent Headline News...in the Spirit of Location and Selection

The New York Times

Fidelity Introduces Location-Based Stock-Picking App, for Some Reason

JAN. 12, 2015
Josh Barro

"The brokerage firm Fidelity announced a new feature Monday on its mobile app: "Stocks Nearby." It helps you hook up with the publicly traded companies doing business nearest your current location.

...While Fidelity found the penny stock across the street, they missed a stock that's zero feet away from my apartment. My landlord, AvalonBay Communities, is a \$23-billion real estate investment trust that trades on the New York Stock Exchange. The most important hyperlocal economic trend in my neighborhood is rapid residential real estate development. By omitting AVB, Stocks Nearby missed that story entirely."

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