

Equity Investing in Real Estate Through Public and Private Markets

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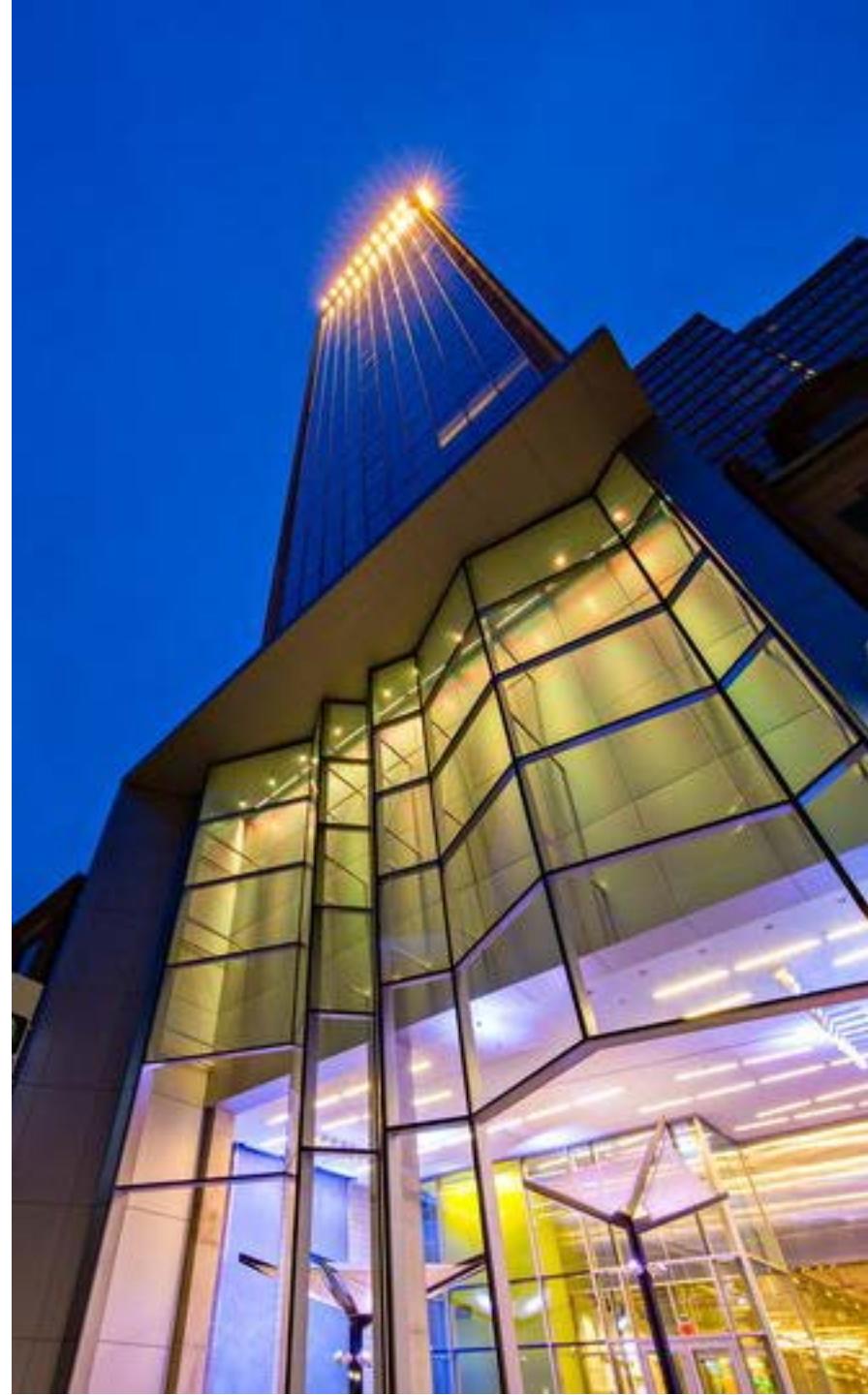


What is a REIT?

REITs are companies and own and manage income-producing real estate.

REITs were developed to *democratize* real estate investment.

- Asset and *income* tests ensure returns reflect real estate investment.
 - At least 75 percent of assets are real estate.
 - At least 75 percent of income comes from ownership of real estate.
- *Ownership* tests ensure ordinary individuals are the main beneficiaries.
 - At least 100 shareholders with transferable shares.
 - Largest five shareholders cannot collectively own more than 50 percent.
- *Distribution* test ensures that real estate returns flow to individuals.
 - Must distribute at least 90 percent of taxable income in the form of dividends.
 - Distributions are deducted from taxable income to prevent double-taxation.
 - Most REITs distribute at least 100 percent of taxable income, so have no remaining income subject to taxation at the corporate level.
- The tests ensure that REIT shareholders have the same tax treatment as individuals or partnerships.



What is “Public Real Estate”?

- “Private real estate” can be offered to *qualified investors* but not to the general public.
 - Private non-REITs
 - Direct investment
 - Co-investment (including joint ventures managed by a REIT)
 - Separate accounts
 - Many private equity investment funds
 - Private REITs (including many other private equity investment funds)
- “Public real estate” must be registered with the SEC and can be offered to the general public.
 - Includes real estate operating companies (REOCs) as well as REITs
- Public REITs may be *listed* or *unlisted*.
 - Listed REITs are traded on major stock exchanges.
 - Non-Listed REITs are sold directly to investors through broker-dealers.
- Equity REITs own primarily physical real estate (e.g., buildings).
- Mortgage REITs own primarily real estate debt (e.g., MBS).
- My discussion focuses on listed equity REITs.



What Should We Talk About Today?

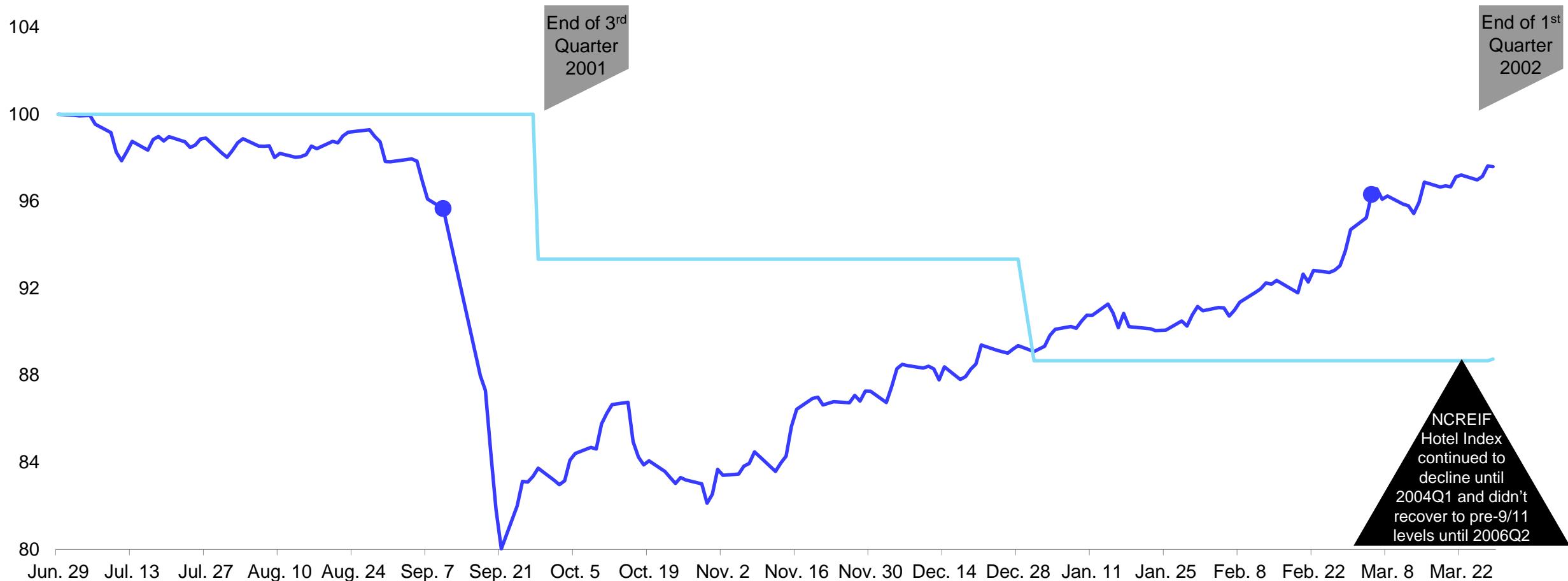
1. Long-term investment attributes of public and private real estate
 - Correlations
 - Volatilities
 - Returns
2. Real estate in the fundamental mixed-asset portfolio
3. The current real estate market situation
 - Duration of the real estate market cycle
 - The macro and interest rate environment
 - Current REIT valuations



Long-Term Investment Attributes of Public and Private Real Estate

Who Is Getting Accurate Performance Measures?

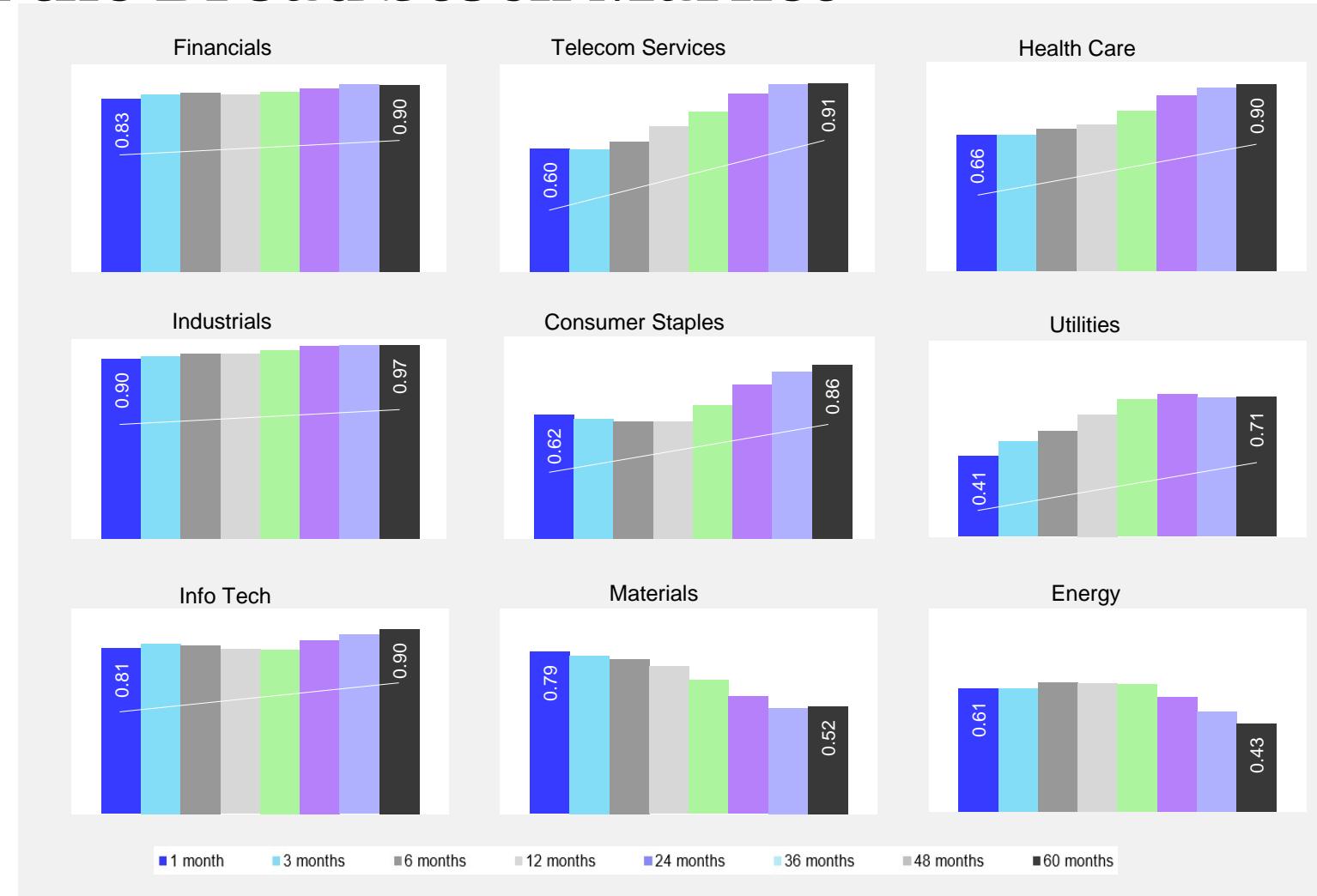
Public and private measures of hotel returns, 2001-2002



Most Sectors Show an Upward-Sloping Term Structure of Correlations with the Broad Stock Market

Upward-sloping term structure means long-term returns respond to the *same* drivers.

- Short-term returns may be affected by information that is of questionable value to investors with long horizons.
- Returns for most companies are driven by developments in the *business cycle*.



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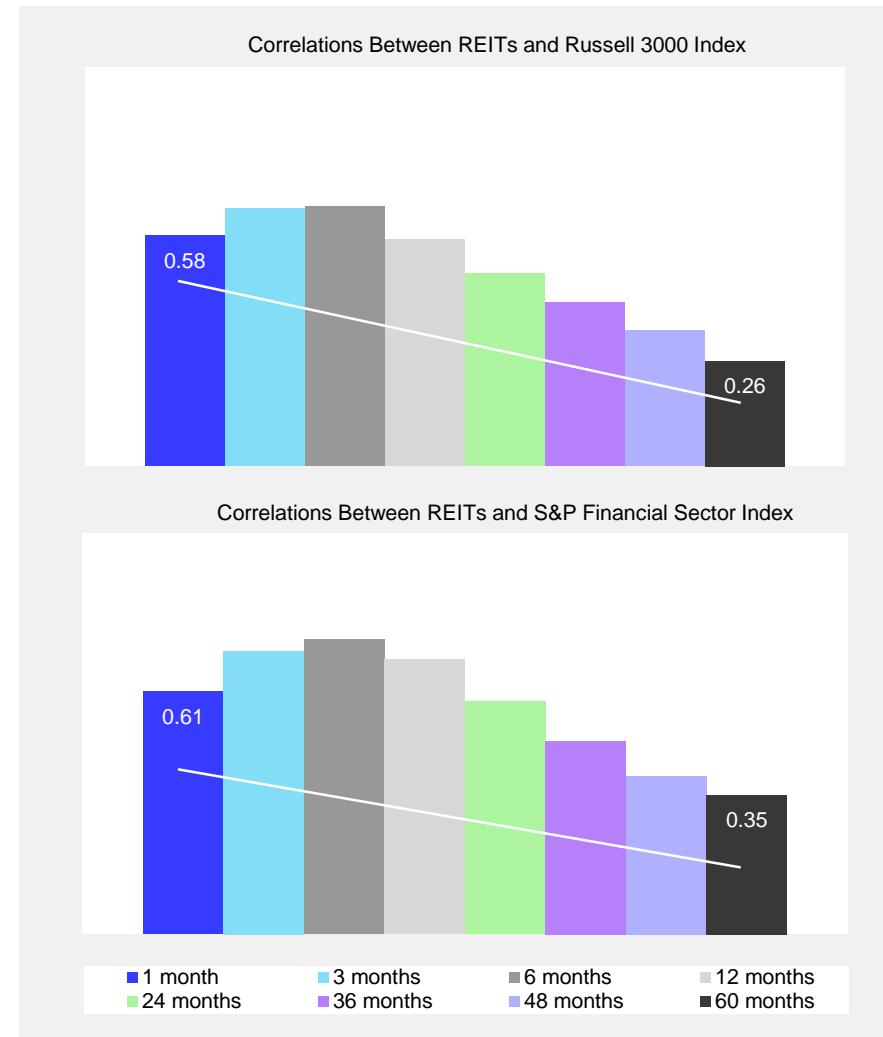
Downward-sloping term structure means long-term returns respond to *different* drivers.

- Returns in the Materials and Energy sectors are driven by developments in the *commodities market cycle*.

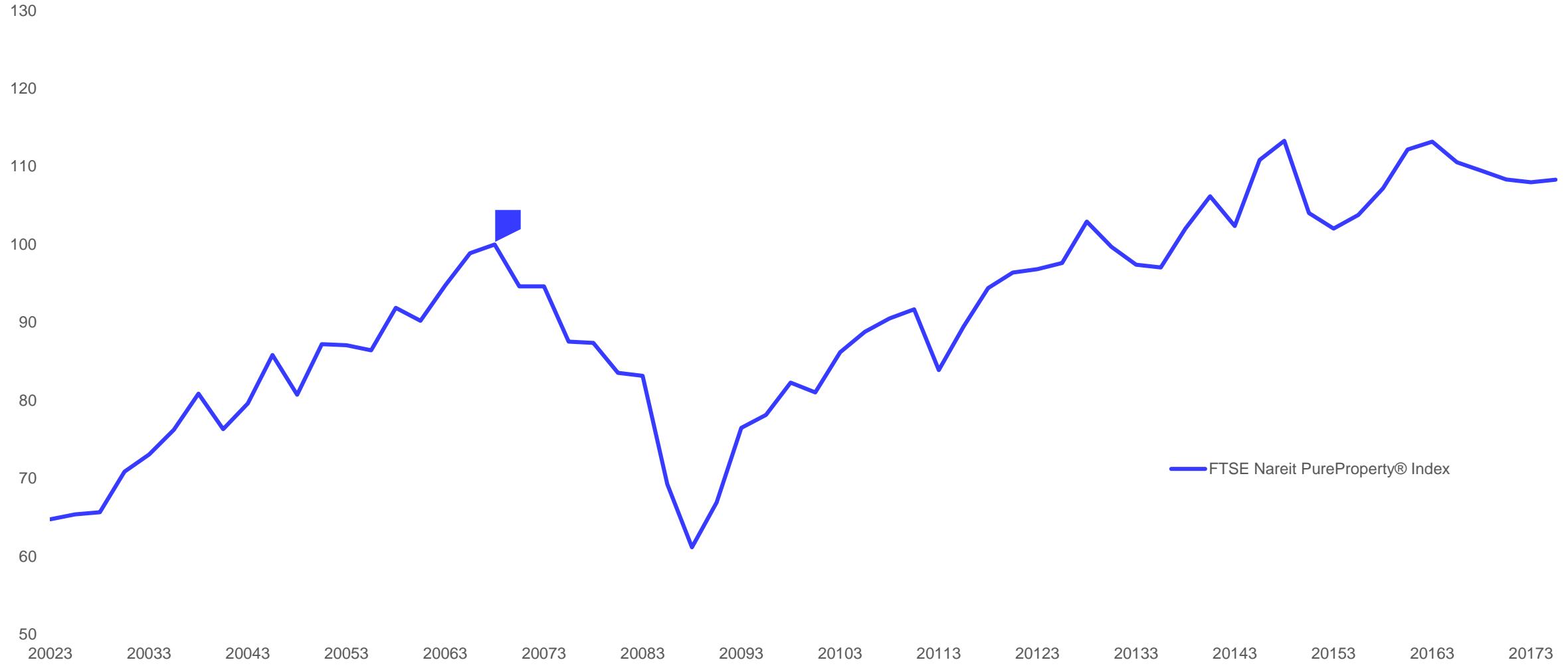


REITs Show a *Downward-Sloping* Term Structure of Correlations with the Broad Stock Market

- Declining REIT-stock correlation over increasing investment horizons indicates that asset returns increasingly *differ* as spillover (mispricing) effects are corrected.
- Declining correlation as errors are corrected is a sign that underlying return drivers are fundamentally different—that is, REITs and non-REITs represent different asset classes.
- REIT returns respond to the long *real estate market cycle*, whereas the broad stock market responds to the much shorter *business cycle*.



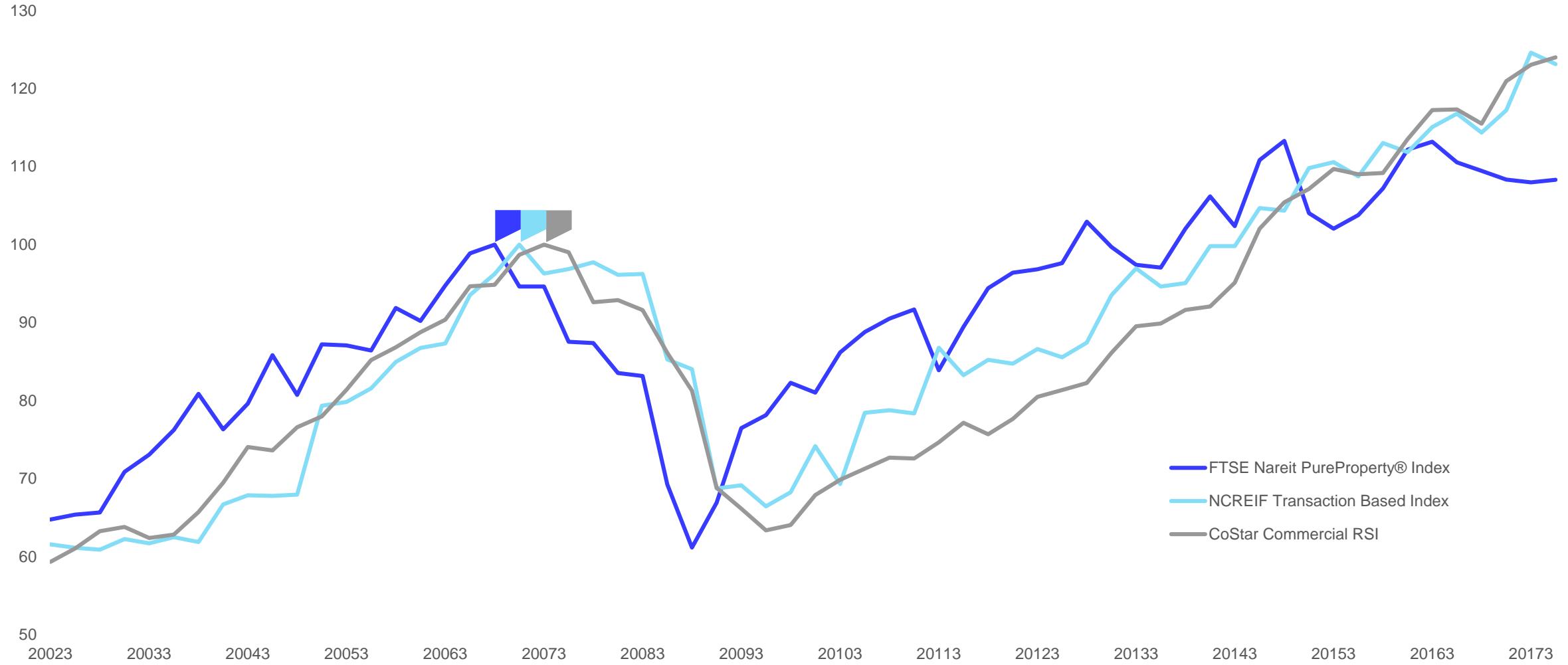
Measurement Lag in Private Real Estate



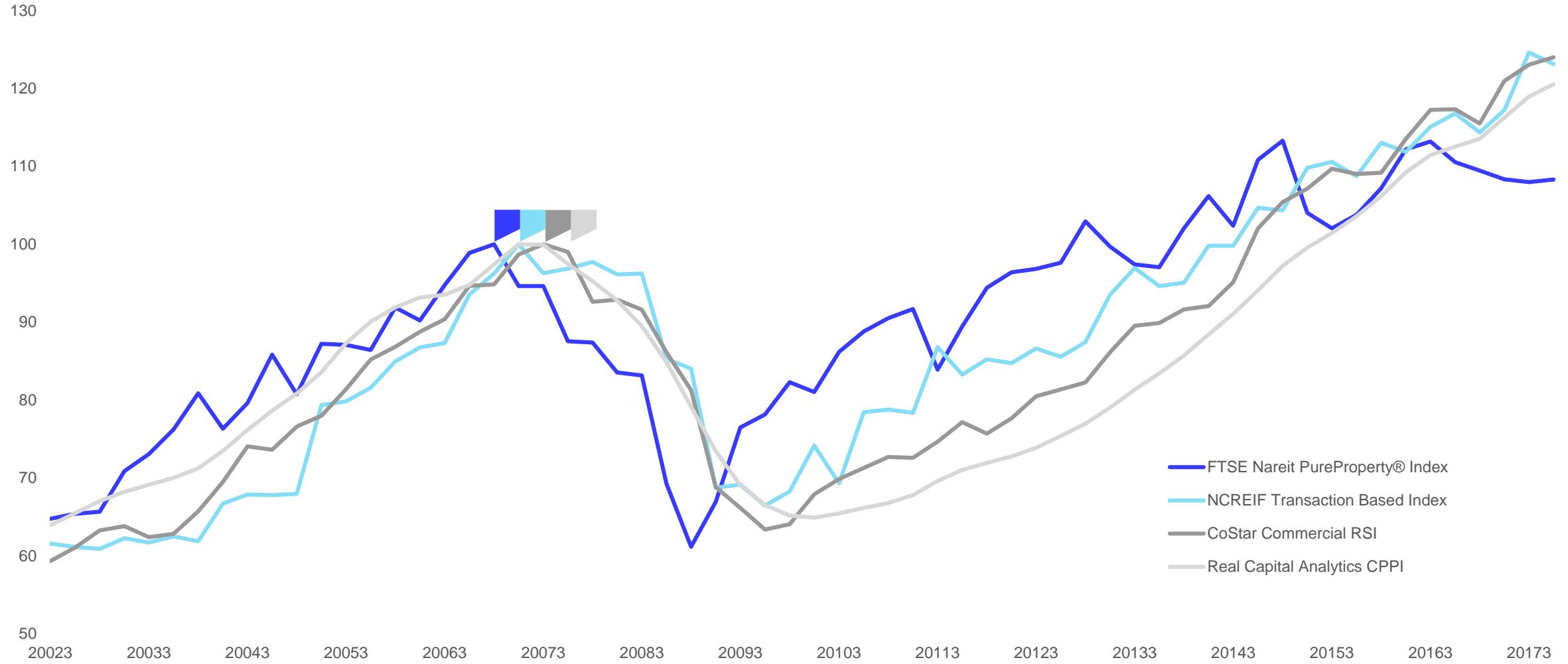
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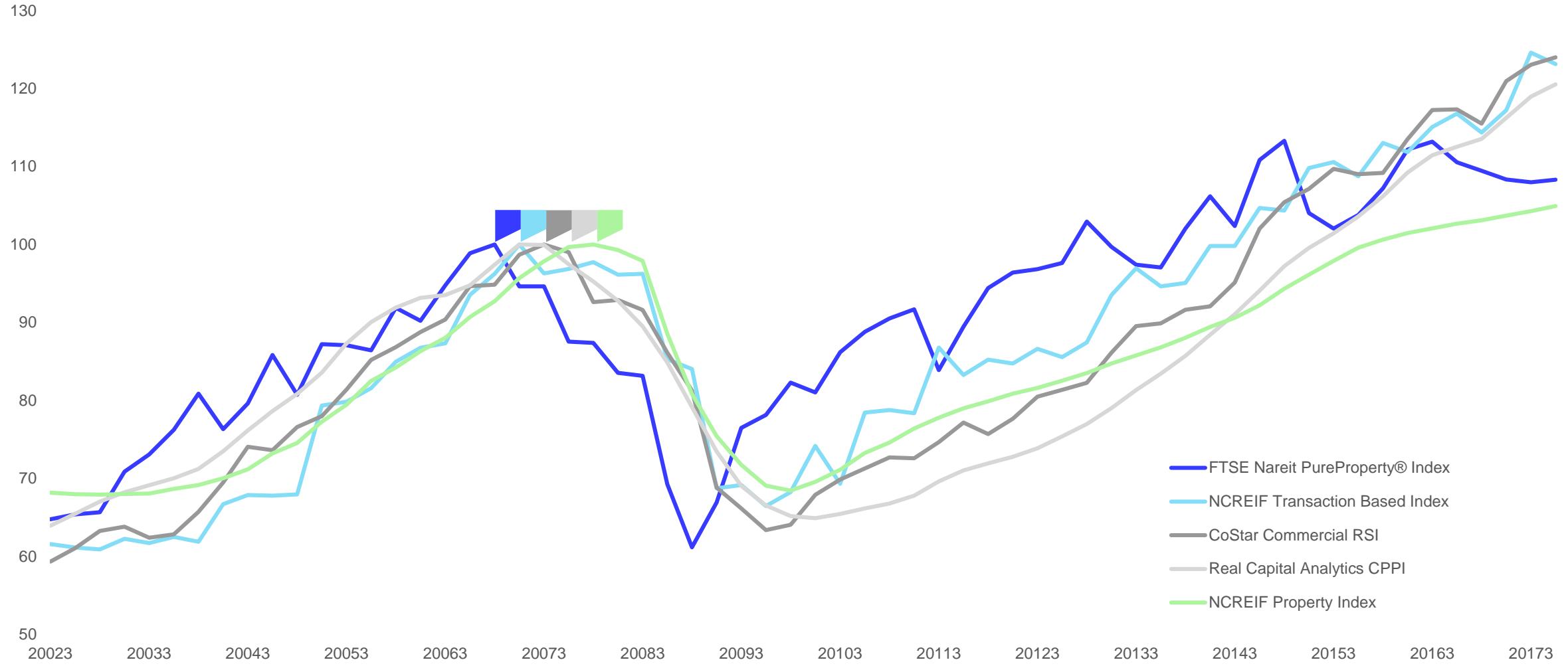
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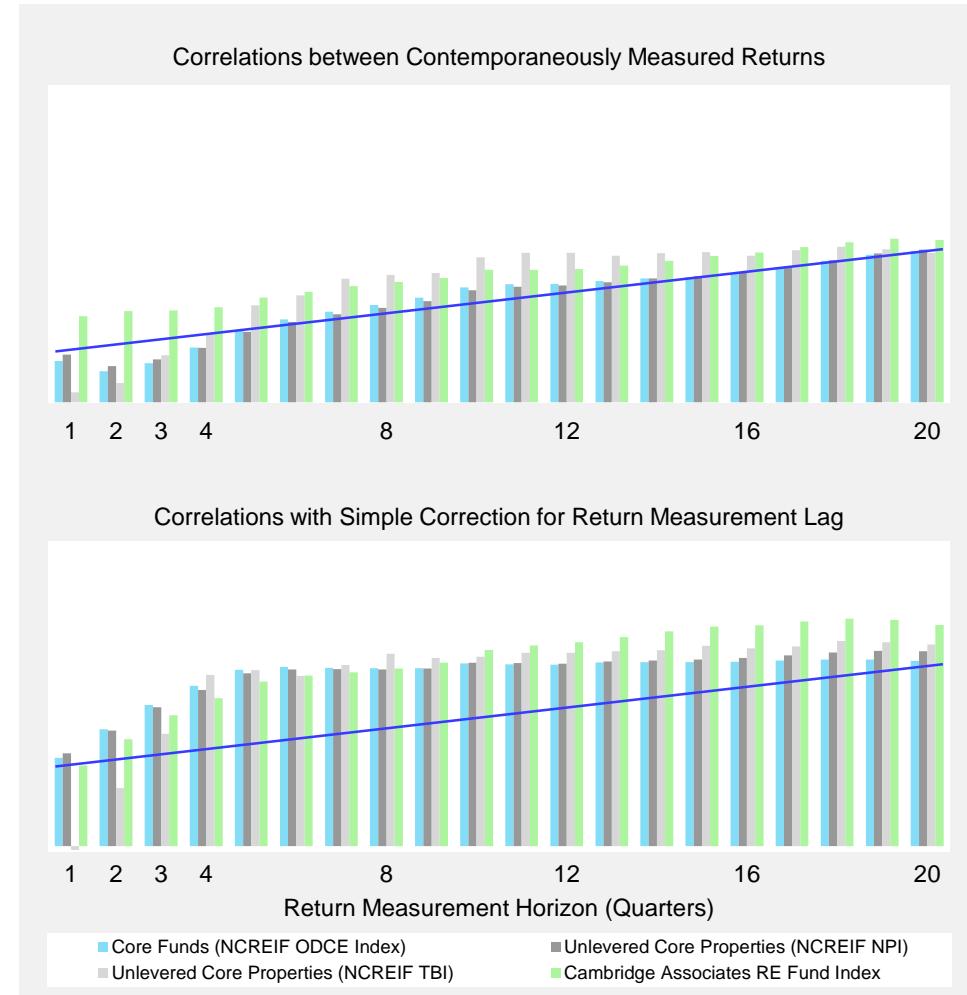


Measurement Lag in Private Real Estate



Upward-Sloping Term Structure of Correlations between Public and Private Real Estate

- An upward-sloping term structure of correlations is characteristic of indices that are in the same asset class but where measurement problems affect reported short-term returns.
- Private real estate returns are measured with several sources of error:
 - Transaction lag (about two quarters)
 - Appraisal lag (about one quarter)
 - Non-appraisal (one to three quarters)
 - Appraisal error (12 percent on average)
- Listed REIT returns are affected by spillover from non-REIT segments of the stock market.
- Correlations computed from short-term return measures are artificially depressed by return measurement problems.
- Correlations increase as the investment horizon lengthens, reflecting the correction of both return measurement problems in private real estate and mispricings in listed REITs.
- Cointegration analysis confirms that “the correlation between Nareit and NCREIF returns approaches one as the investment horizon lengthens.”



CEM Benchmarking: REIT Correlations with Equities and Unlisted Real Estate

Key Correlations: Equities, REITs and Unlisted Real Estate
1998-2015

	U.S. Large Cap Public Equity	U.S. Small Cap Public Equity	Non-U.S. Public Equity	Private Equity	Unlisted Real Estate	REITs
U.S. Large Cap Public Equity	1.00	0.92	0.89	0.85	0.49	0.55
U.S. Small Cap Public Equity		1.00	0.89	0.88	0.58	0.64
Non-U.S. Public Equity			1.00	0.91	0.55	0.58
Private Equity				1.00	0.54	0.50
Unlisted Real Estate					1.00	0.92
REITs						1.00

What Should We Talk About Today?

1. Long-term investment attributes of public and private real estate

- Correlations ✓ both provide *asset class* diversification
- Volatilities
- Returns

2. The fundamental mixed-asset portfolio

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Public and Private Real Estate Have Virtually Identical Volatilities, Conditional on the Use of Leverage

	Capital Appreciation		Total Return	
	Unlevered REITs	Unlevered Private Real Estate	Unlevered REITs	Unlevered Private Real Estate
Apartment	10.3%	10.2%	10.3%	10.2%
Industrial	10.8%	10.0%	10.8%	10.0%
Office	11.0%	10.2%	11.0%	10.2%
Retail	11.6%	10.5%	11.7%	10.7%
East Region*	11.5%	10.5%	11.6%	10.6%
Midwest Region*	10.5%	9.6%	10.5%	9.7%
South Region*	9.9%	9.9%	9.9%	10.0%
West Region*	11.4%	10.2%	11.4%	10.2%
Aggregate*	10.7%	10.1%	10.7%	10.2%

Private real estate is illiquid, and therefore significantly more risky than public real estate.

Source: Nareit analysis of quarterly data from NCREIF Transaction Based Index (NTBI) and FTSE Nareit PureProperty® Index Series, 2002Q3-2017Q4. Quarterly returns for the NTBI are based on all properties in the NCREIF Property Index (NPI) data base that transacted at any time during each quarter; quarterly returns for the PureProperty are based on only the last transaction of stock for each constituent REIT during each quarter. *Includes health care and hotel properties, which are typically slightly more volatile.

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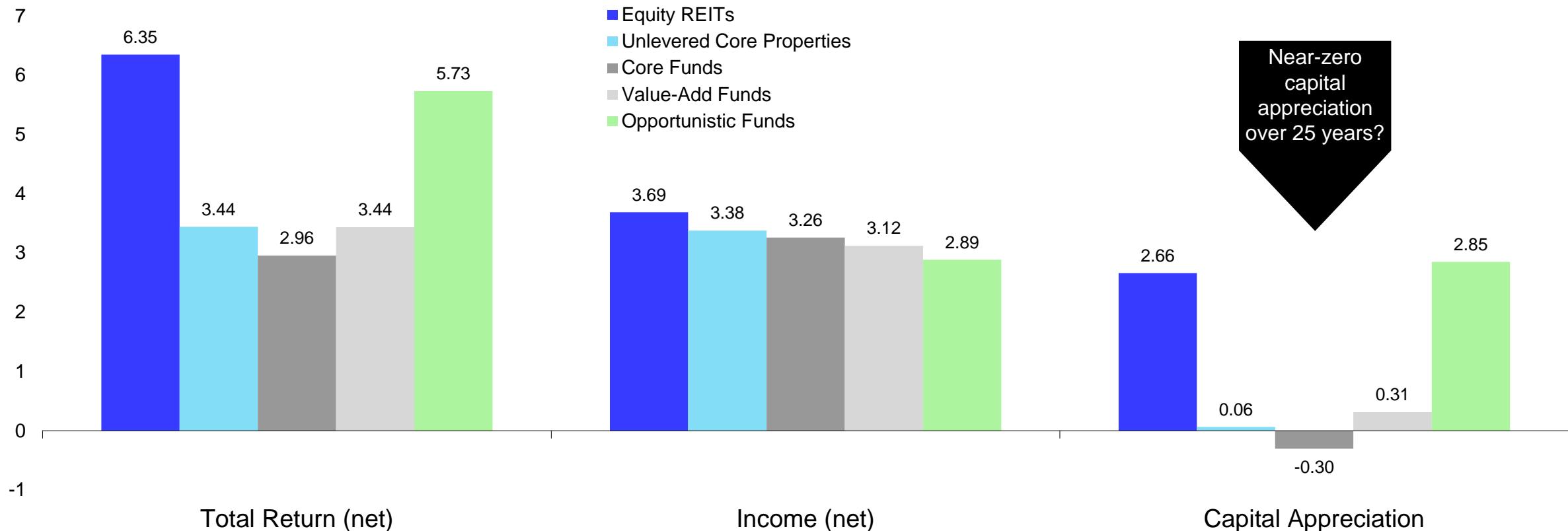
Net Total Returns Through a Full Real Estate Market Cycle

Form of Real Estate Investment	Typical Leverage	Average Fees and Expenses	Duration of Real Estate Cycle	Full-Cycle Net Total Returns
Unlevered Properties	0 percent	≈100 basis points	17¾ years 1990Q3 - 2008Q2	275 percent 7.7 percent / year
Open-End Diversified Core Funds	≈22 percent	107 basis points	17¾ years 1990Q3 - 2008Q2	272 percent 7.7 percent / year
Value-Add Private Equity Real Estate Funds	≈51 percent	170 basis points	17¼ years 1990Q3 - 2007Q4	348 percent 8.9 percent / year
Opportunistic Private Equity Real Estate Funds	≈64 percent	257 basis points	17½ years 1990Q3 - 2008Q1	716 percent 12.9 percent / year
Exchange-Traded Equity REITs	≈38 percent	≈52 basis points	17½ years 1989Q3 - 2007Q1	802 percent 13.4 percent / year

REITs significantly outperformed every category of private real estate, especially at the property level.

Source: Nareit analysis of quarterly net total returns. Unlevered properties: NCREIF Property Index, assuming fees and expenses of 25 basis points per quarter. Open-End Diversified Core Funds: NCREIF ODCE Index. Value-Add and Opportunistic Private Equity Real Estate Funds: NCREIF/Townsend Funds Index. Exchange-Traded Equity REITs: FTSE Nareit All Equity REIT Index, assuming fees and expenses of 13 basis points per quarter. Returns are not adjusted for differences in leverage.

Net Income and Capital Appreciation Components of Net Total Return, 1988q3-2013q3



Source: Nareit analysis of data from NCREIF Property Index (unlevered core properties, NCREIF ODCE Index (core funds), NCREIF/Townsend Fund Indices (value added and opportunistic funds), and FTSE Nareit All Equity REITs Index (equity REITs). Expenses for equity REITs are estimated at 50 bps per year, distributed equally across all months; expenses for unlevered core properties are assumed to equal 100 bps per year, distributed equally across all quarters. Expenses are attributed to income returns only, in accordance with ODCE. Assumes no reinvestment of net income.

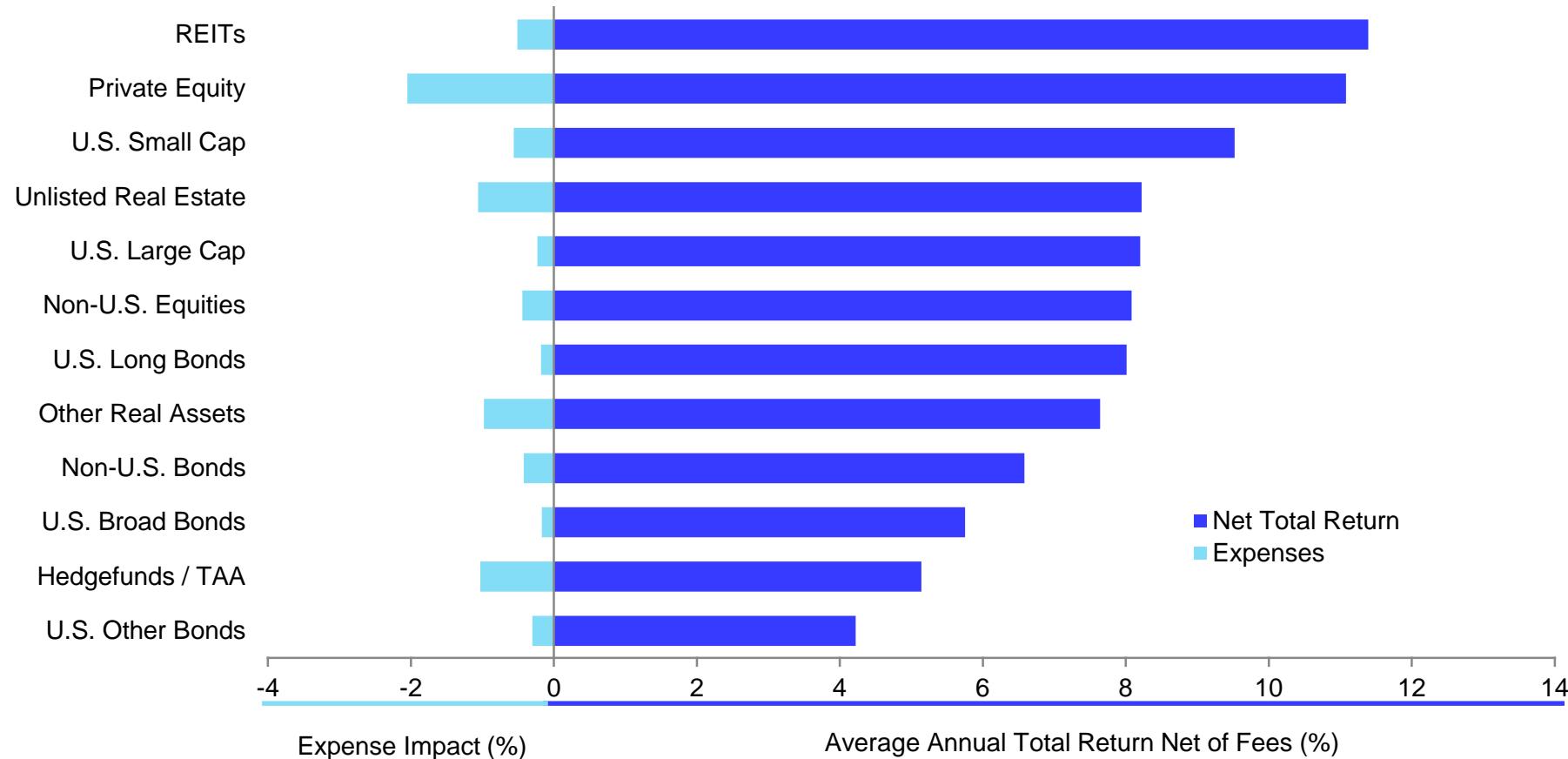
Every Academic Study Ever Conducted Has Found that Public Real Estate Outperformed Private Real Estate

- Kiehelä & Falkenbach (2015): PERE funds constantly and significantly underperformed the public market.
- Ling, Naranjo & Scheick (2015): Public market real estate returns outperform comparable private market returns.
- Andonov, Eichholtz & Kok (2014): REITs delivered a higher gross return as compared to direct real estate investments.
- Ling & Naranjo (2014): Unlevered core REITs outperformed their private market benchmark by 49 basis points (annualized) over the 1994-2012 sample period.
- Fisher & Hartzell (2013): Real estate private equity rarely out-performed REITs, and for some vintages the underperformance was substantial.
- Alcock, Baum, Colley & Steiner (2013): We find evidence for systematic underperformance (by private equity real estate investment funds).
- Andonov, Kok & Eichholtz (2013): Indirect real estate has done better for pension funds in three ways: the gross return was higher, the cost wedge between gross and net was lower, and the benchmark-adjusted return was positive.
- Urban Land Institute (2011): This research concludes that real estate funds in general have not delivered the required risk/return characteristics that investors would have expected or are led to believe.
- Bond & Mitchell (2010): The widespread finding is that very few managers investing in the direct real estate market appear to be able to generate excess risk-adjusted returns.
- Tsai (2007): At the all-sector level, the difference in mean returns between the REIT index and NPI is found to be 2.66% after return restatement.
- Riddiough, Moriarty & Yeatman (2005): Annualized NCREIF index returns over the entire sample period were 7.36%, compared to an adjusted annualized return of 10.44% for the REIT index.
- Pagliari, Scherer & Monopoli (2005): The data indicate that REITs outperformed private-market real estate by approximately 3.0% per annum.



CEM Benchmarking: REITs Outperformed Other Major Asset Classes: 1998 to 2015

Annual Net Total Return and Expense by Asset Class
(1998 – 2015)

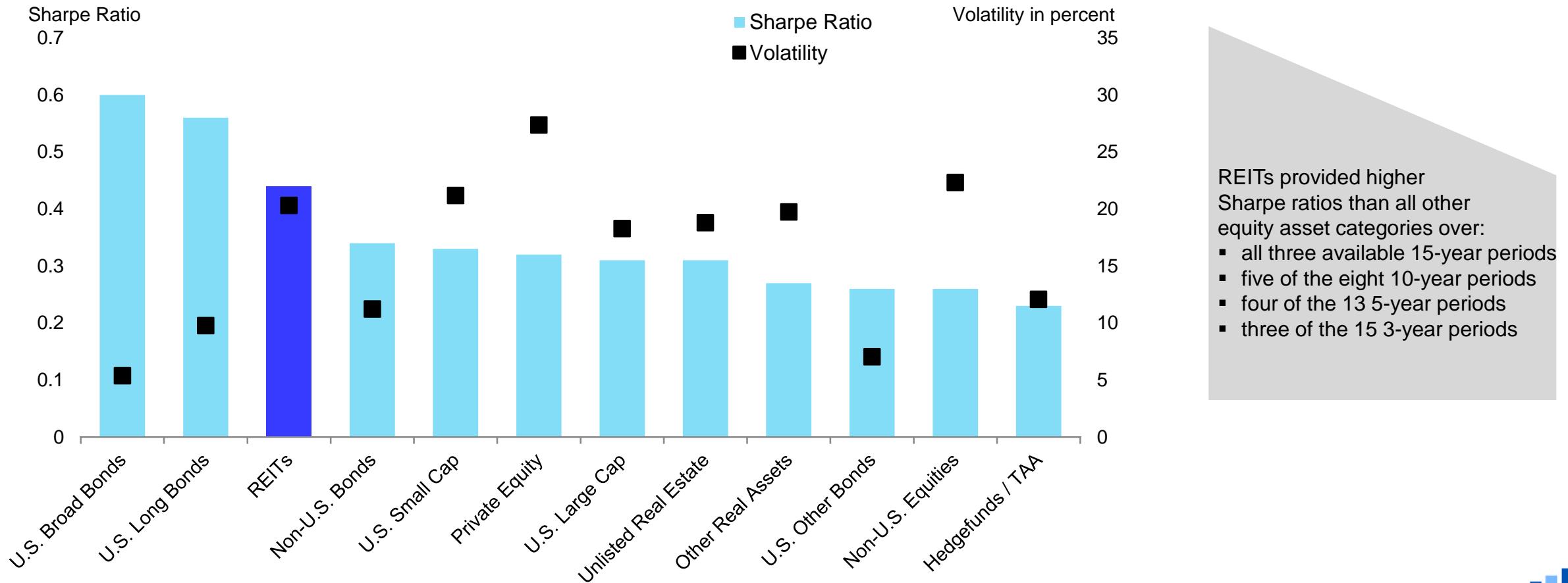


REITs provided higher average net total returns than all other asset categories over:

- all three available 15-year periods
- five of the eight 10-year periods
- four of the thirteen 5-year periods
- six of the fifteen 3-year periods

CEM Benchmarking: REITs Delivered Superior Risk Adjusted Returns

Volatility and Risk Adjusted Returns by Asset Class
(1998 - 2015)



REITs provided higher Sharpe ratios than all other equity asset categories over:

- all three available 15-year periods
- five of the eight 10-year periods
- four of the 13 5-year periods
- three of the 15 3-year periods

Why Have REITs Outperformed Private Real Estate?

- Transparency vs Opacity
 - Myth: investment managers must protect their ideas and strategies.
 - Reality: opacity protects managers when they make poor decisions; transparency subjects them to *capital market discipline*.
- Liquidity vs Lock-Up
 - Myth: good investments can be made only if investors lock up capital.
 - Reality: illiquidity protects managers when they make poor decisions; liquidity subjects them to *capital market discipline*.
- Corporate Governance / Alignment of Interest
 - Incentive compensation for REIT executives is almost entirely restricted stock.
 - Management fees and “promotes” drive a wedge between the interests of private equity fund managers and investors.
- Access to Capital
 - Myth: the distribution requirement prevents REITs from having access to capital, so prevents them from making good investments.
 - Reality: REITs have access to capital from all parts of the market; unrestricted capital enables managers to make poor decisions, while the REIT distribution requirement subjects them to *capital market discipline*.
- Public/Private Arbitrage Opportunity
 - REITs tend to *buy* properties (and sell securities) when properties are inexpensive on the private market, and *sell* properties (and buy securities) when properties are expensive on the private market.
 - REITs own about 20 percent of institutional-quality real estate assets.



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- Volatilities ✓ almost identical equity-like volatility for both
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Real Estate in the Fundamental Mixed- Asset Portfolio

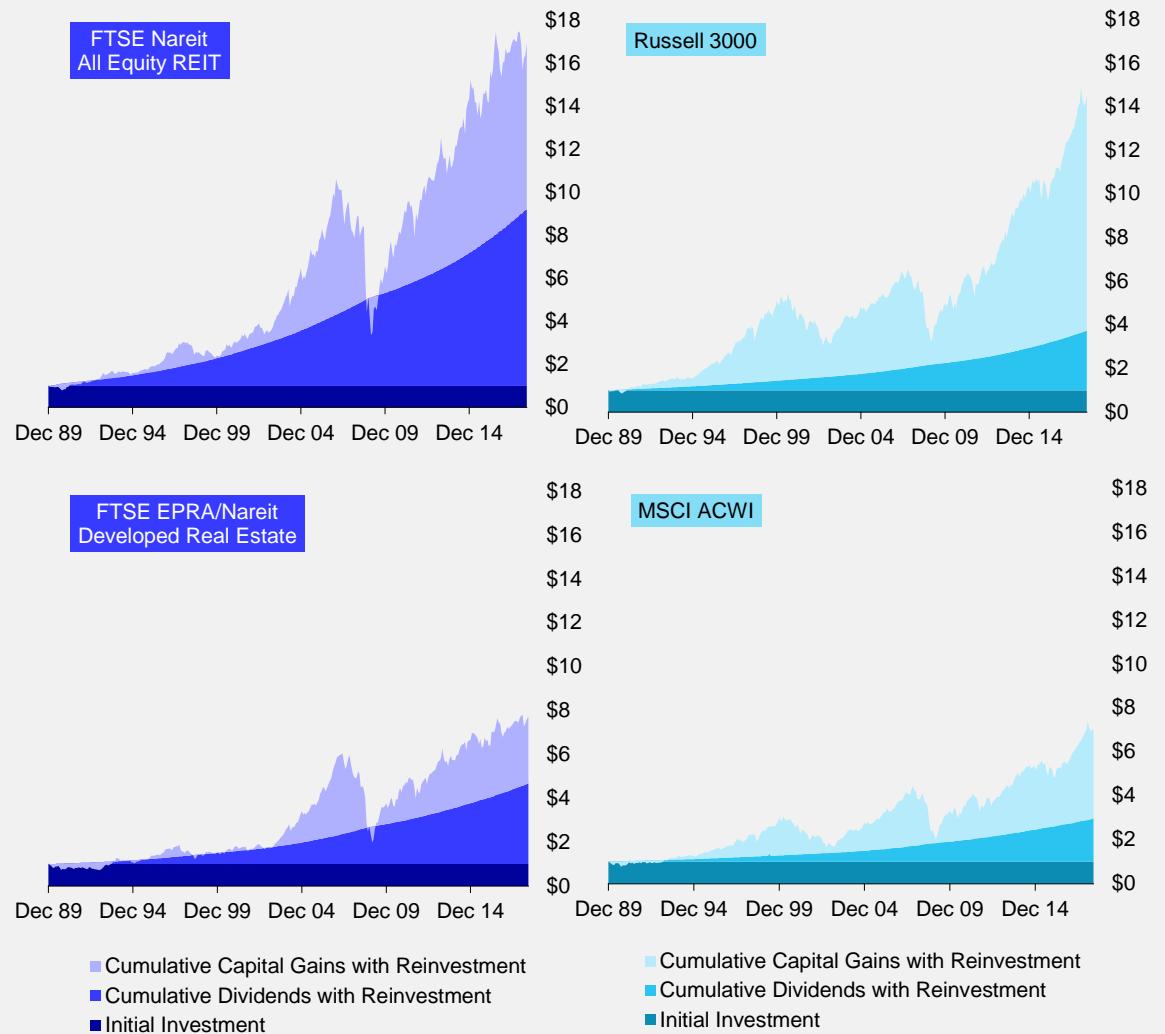
REITs have Relatively Low Correlations with All Major U.S. and Global Asset Classes

	Listed U.S. Mortgage REITs	Non-U.S. LPCs	U.S. REIT Preferred Stocks	U.S. Large-Cap Stocks	U.S. Small-Cap Value Stocks	Non-U.S. Stocks	U.S. Bonds	Non-U.S. Bonds	Volatility (%)
Equity REITs	0.59	0.64	0.44	0.45	0.57	0.40	0.33	0.25	13.8
Mortgage REITs		0.42	0.43	0.47	0.54	0.28	0.41	0.08	16.2
Non-U.S. Listed Property Companies			0.28	0.67	0.52	0.84	0.23	0.59	15.1
U.S. REIT Preferred Stocks				0.10	0.22	-0.09	0.63	0.14	7.7
U.S. Large-Cap Stocks					0.71	0.81	0.05	0.21	11.1
U.S. Small-Cap Value Stocks						0.48	0.11	0.09	15.2
Non-U.S. Stocks							0.07	0.40	13.3
U.S. Bonds								0.47	3.1
Non-U.S. Bonds									7.7

Source: Nareit analysis based on a DCC-GARCH (Dynamic Conditional Correlation – Generalized Autoregressive Conditional Heteroskedasticity: Engle 2002) model using monthly total returns through May 2018. Equity REITs (FTSE Nareit All U.S. Equity REIT), mortgage REITs (FTSE Nareit Mortgage REIT), and U.S. large-cap stocks (Russell 1000) from January 1972; non-U.S. listed property companies (FTSE EPRA/Nareit Developed x-US) from January 1990; REIT preferred stocks (BofA/ML Preferred Stock REITs) from January 1997; small-cap value stocks (Russell 2000 Value) from January 1979; non-U.S. stocks (MSCI AC World ex-US) from January 1988; U.S. bonds (Bloomberg Barclays US Aggregate) from January 1976; non-U.S. bonds (Bloomberg Barclays Global Aggregate x-USD) from January 1990.

Steady Dividends are an Important Component of Total Returns

- REIT income returns have averaged 5.40 percent per year
 - 52 percent of their total
- U.S. stock income returns have averaged 2.00 percent per year
 - 20 percent of their total
- U.S REITs distributed \$58 billion in dividends in 2017.



Source: Nareit analysis of monthly total returns in USD for the FTSE Nareit All Equity REIT Index, FTSE EPRA/Nareit Developed Real Estate Index, Russell 3000 Total U.S. Stock Market Index, and MSCI All-Country World Stock Index as of May 2018.

REITs Have an Important Role in Target-Date Funds

	Mean-Variance Optimization Excluding REITs	Mean-Variance Optimization Including Global REITs	Surplus Optimization Including Global REITs
Cash	0.0%	0.0%	0.0%
TIPS	5.2%	4.1%	0.0%
U.S. Bonds	21.7%	26.3%	32.8%
High Yield	5.9%	1.8%	0.0%
Non-U.S. Bonds	6.7%	4.5%	5.1%
Large Cap	27.6%	27.7%	23.6%
Small Cap	7.0%	6.0%	1.0%
Global REITs	0.0%	6.5%	11.6%
Non-U.S. Dev'd Mkts	20.0%	18.0%	15.0%
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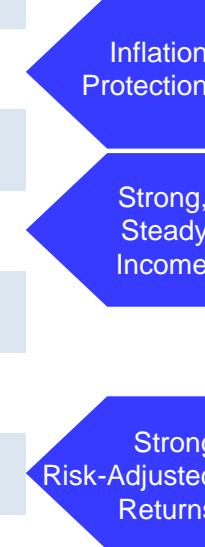
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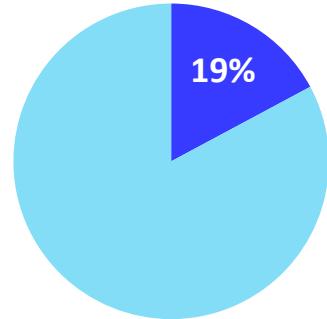
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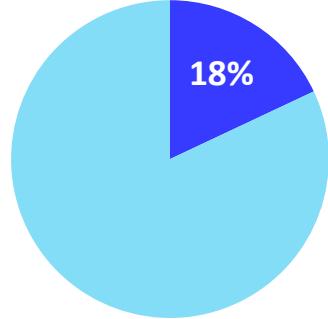
Portfolio Allocations to Real Estate

Different researchers, methodologies and time periods

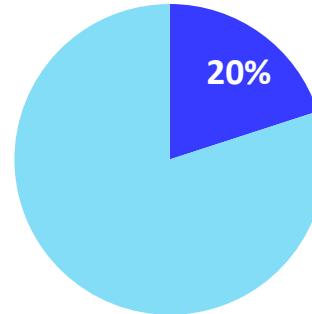
Wilshire Analysis
Surplus Optimization
1990-2016



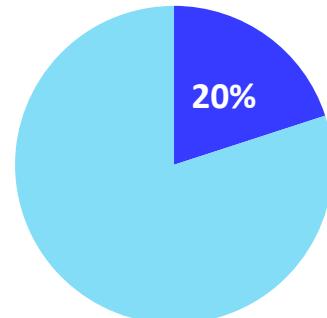
Wilshire Analysis
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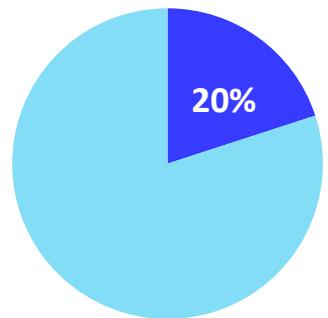
Morningstar Analysis
Liability Relative Investing
1990-2009



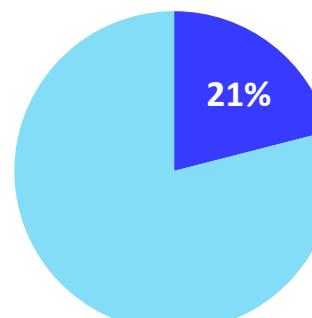
Morningstar Analysis
Fat Tail Optimization
1990-2009



Morningstar Analysis
Mean Variance Optimization
1990-2010



Morningstar Analysis
Mean Variance Optimization
1990-2007



Real Estate is One of the Four *Fundamental Asset Classes*

- Real estate investment has long been recognized as a core asset class by large and small institutional investors, including pension and retirement funds.

“Basically, there are only four types of investment categories that you need to consider: Cash, Bonds, Common Stocks and Real Estate.”

– Burton G. Malkiel, PhD (Economist, Princeton),
The Random Walk Guide to Investing

- Real estate investment provides a unique combination of attributes:
 - Hybrid investment returns with elements of both stocks and bonds
 - Investment grade real property assets provide a measure of inflation hedging
 - Real estate cycle does not coincide with the overall economic cycle
 - Moderate correlation with other assets over time provides potential diversification



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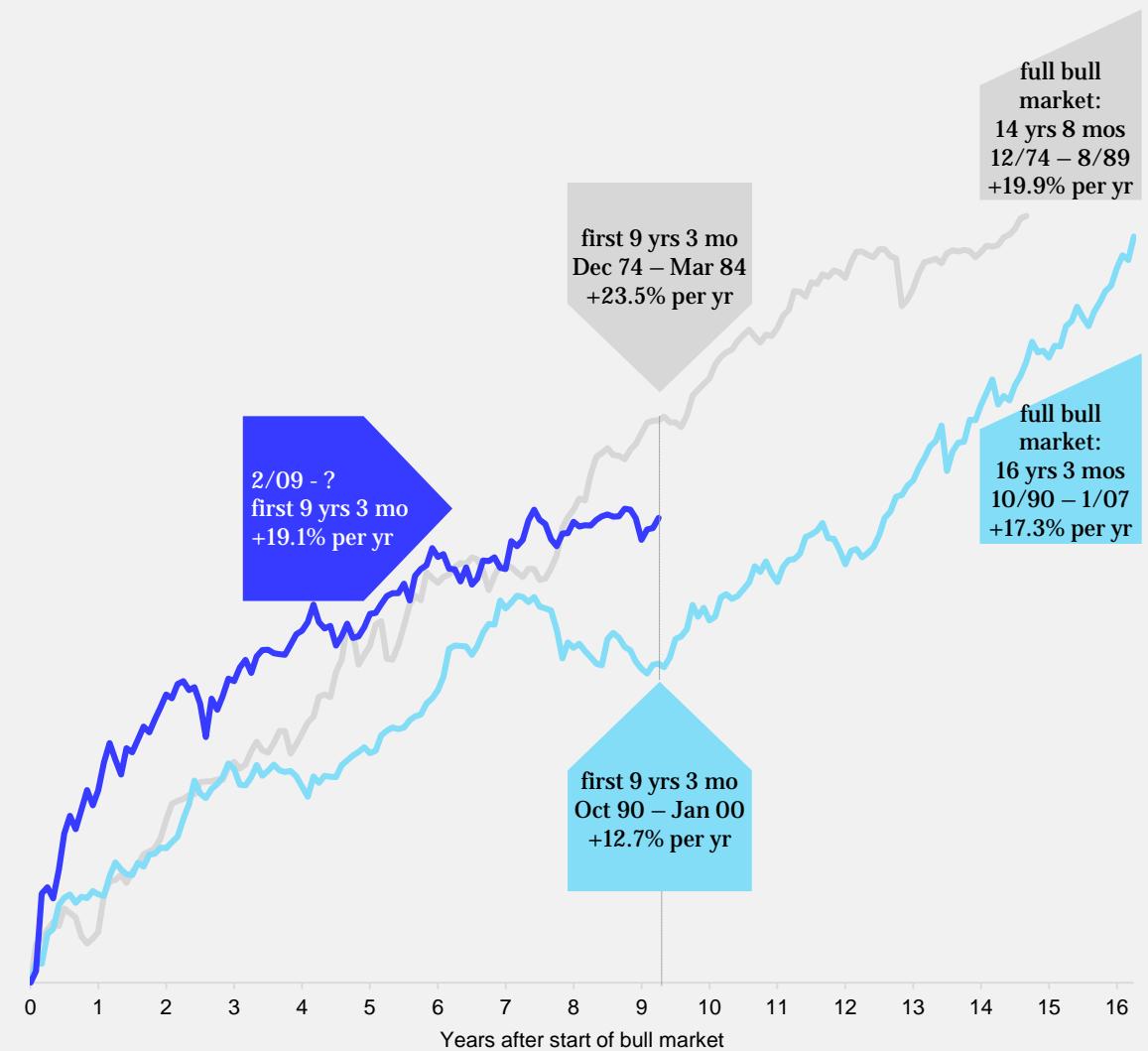
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The Current Real Estate Market Situation

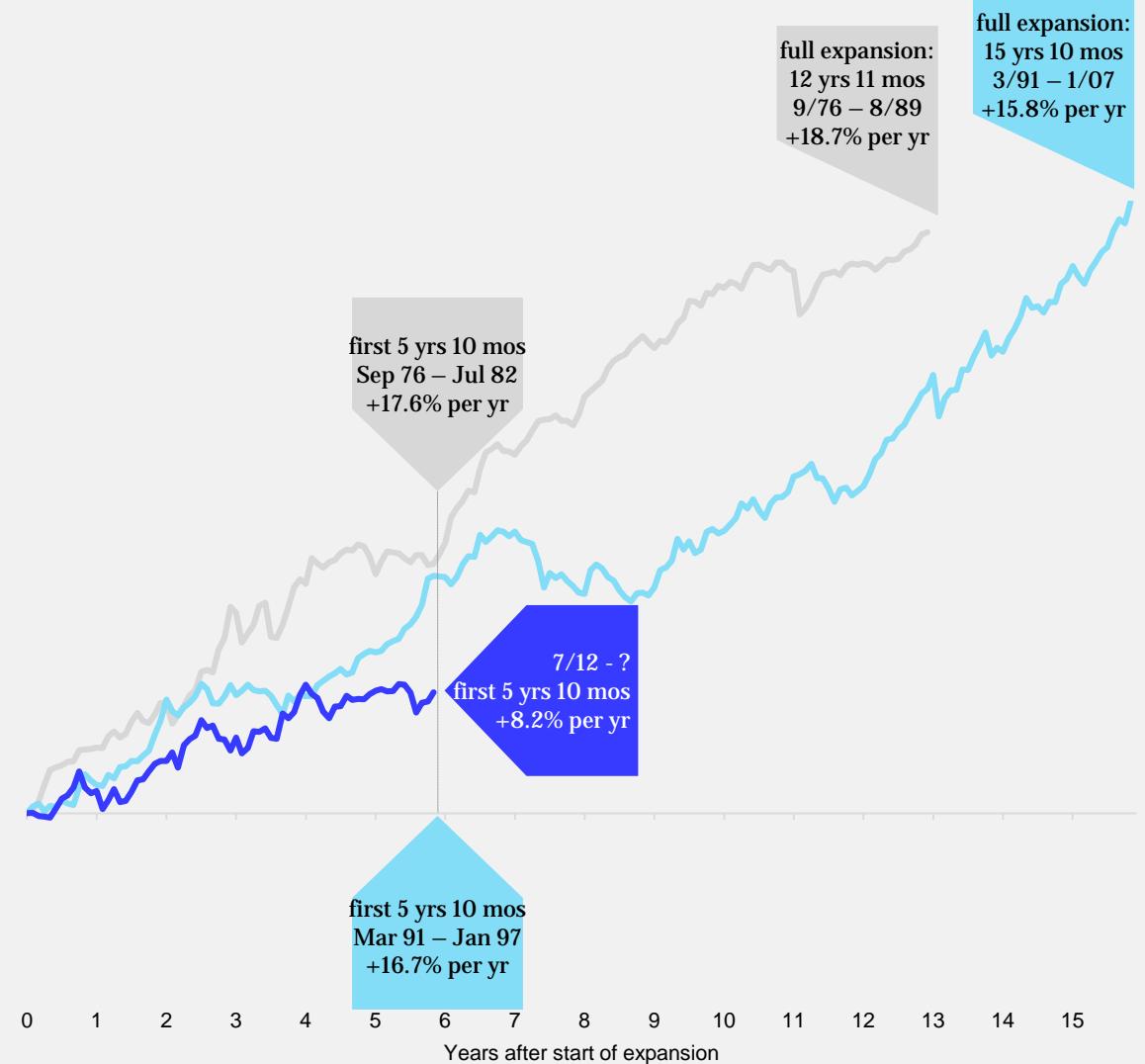
Typical Duration of the Cyclical Real Estate *Bull Market* is 15-16 Years

- The long *cyclical* real estate bull market may include *non-cyclical* months or quarters of negative performance.
- To date the duration of the current cyclical bull market is far less than previous cyclical bull markets.
- Average total returns to date have been comparable to the equivalent segment of previous cyclical bull markets, despite beginning from the trough of a liquidity crisis.



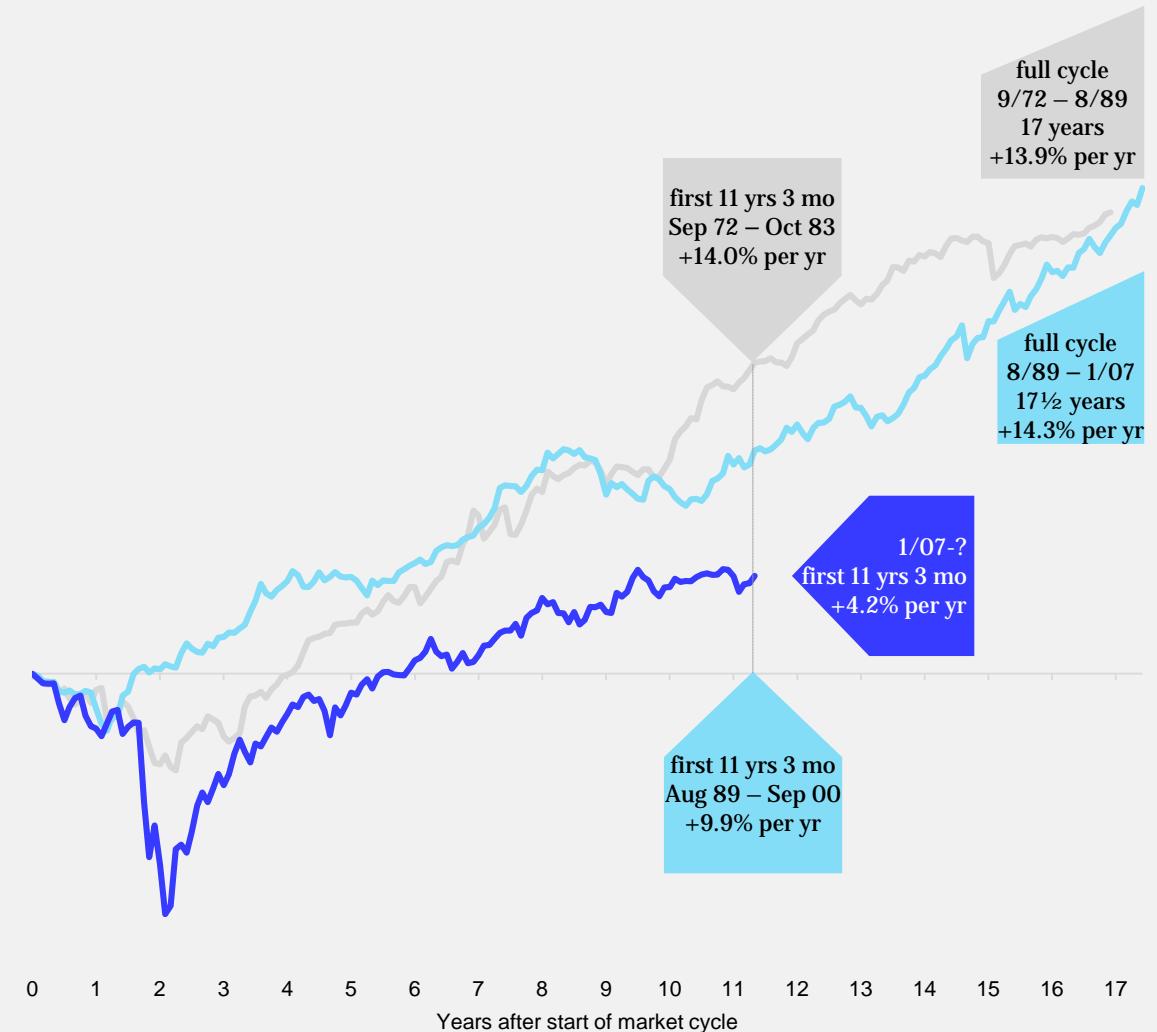
Typical Duration of Cyclical Real Estate Expansion is 13-16 Years

- The cyclical expansion starts when the recovery from the previous cyclical downturn has been completed.
- The long *cyclical* real estate expansion may include *non-cyclical* months or quarters of negative performance.
- To date the duration of the current cyclical expansion is far less than previous cyclical expansions.
- Average total returns to date have been far less than during previous cyclical expansions.



Typical Duration of the Real Estate Market *Cycle* is Close to 18 Years

- The long real estate market *cycle* may encompass several weak *non-cyclical* months or quarters.
- To date the duration of the current cycle is far less than previous cycles.
- Average total returns to date have been far lower than over full previous market cycles.
- The typical duration of the real estate market cycle was first observed in 1933 by the great real estate market researcher Dr. Homer Hoyt.



What Should We Talk About Today?

1. Long-term investment attributes of public and private real estate

- Correlations ✓ both provide *asset class* diversification
- Volatilities ✓ almost identical equity-like volatility for both
- Returns ✓ REITs have consistently outperformed private real estate

2. The fundamental mixed-asset portfolio ✓

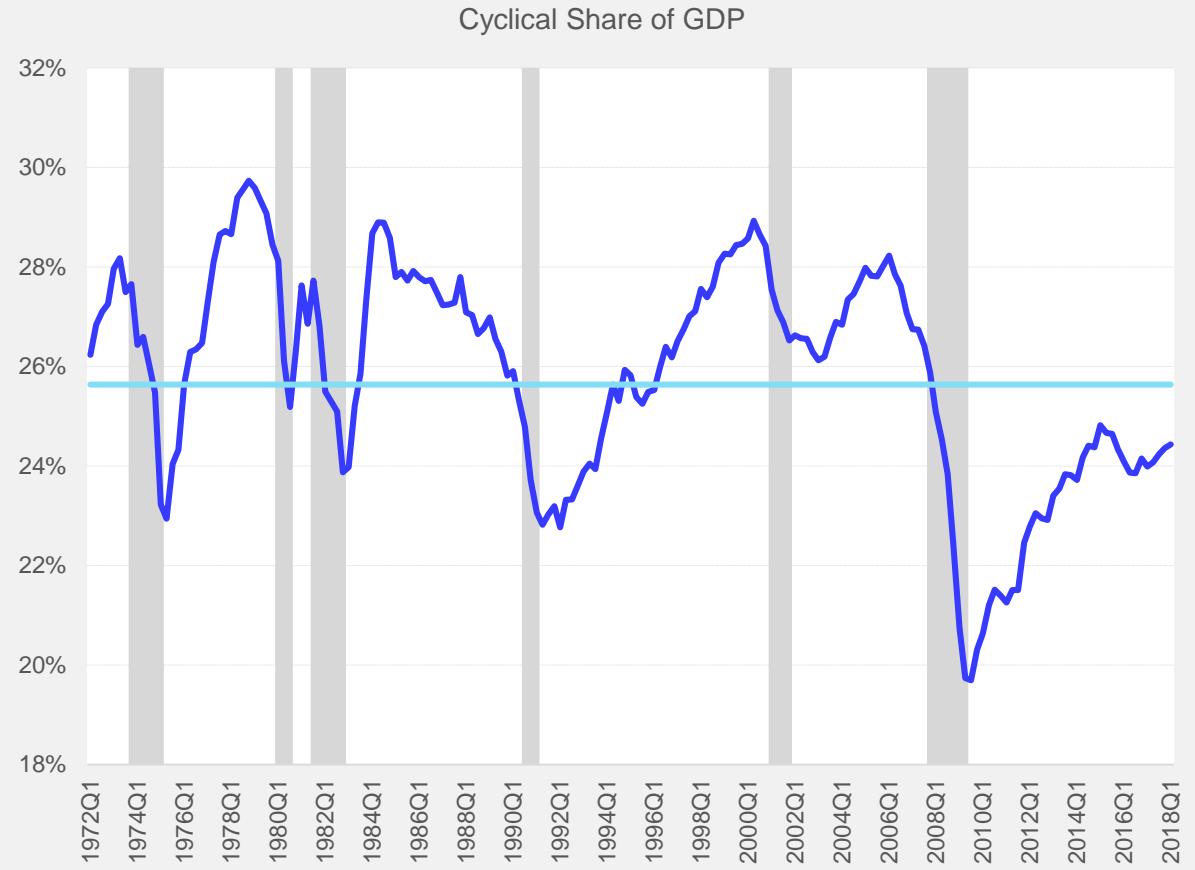
3. The current real estate market situation

- Duration of the real estate market cycle ✓ still young
- The macro and interest rate environment
- Current REIT valuations



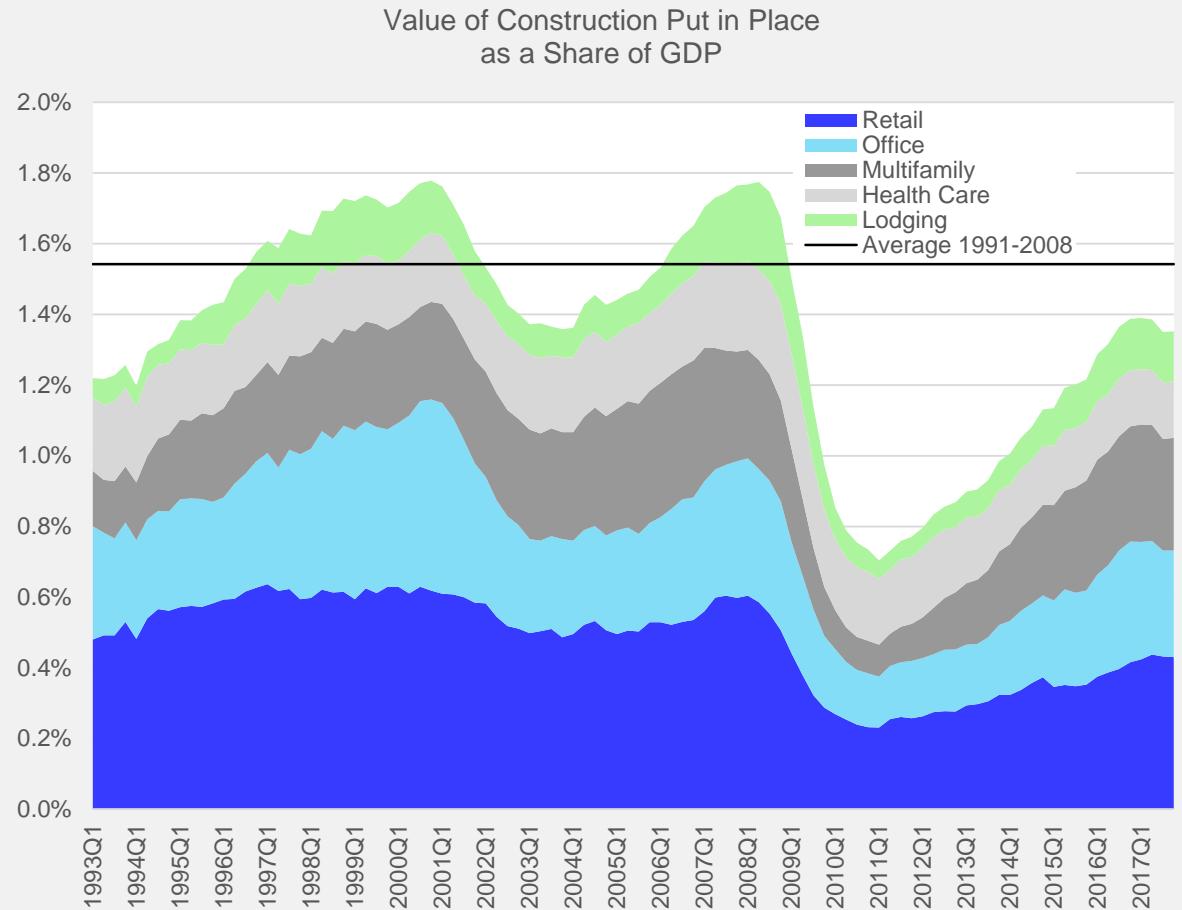
Typical Signs of a Downturn Are Absent

- Recessions have typically followed periods when the share of GDP from cyclical segments was abnormally high.
- Currently the share of GDP from cyclical segments is still abnormally low.



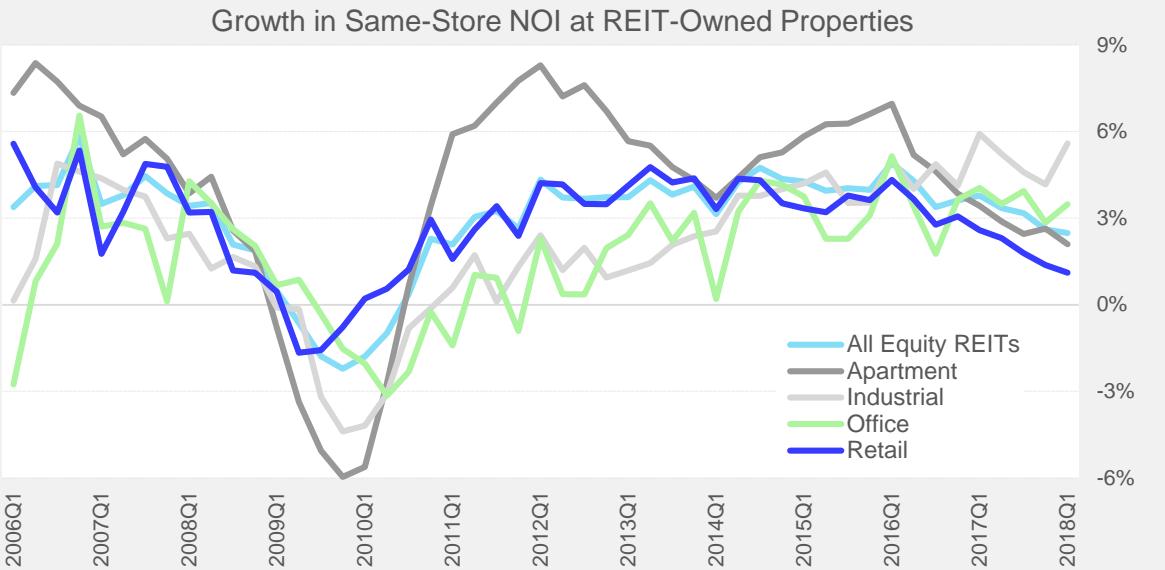
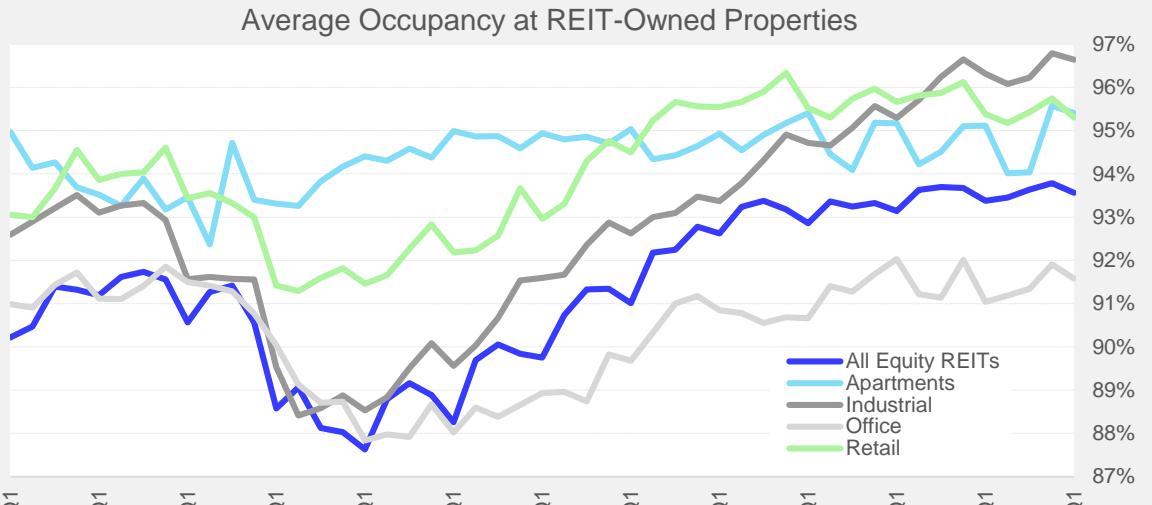
Construction Still Hasn't Recovered to Normal

- From 1993 until the start of the Great Financial Crisis the real value of new construction put in place averaged more than 1.5 percent of GDP.
- As a result of the GFC new construction plummeted to less than half its previous average.
- Since the GFC construction grew to almost 1.4 percent of GDP before declining slightly during 2017.

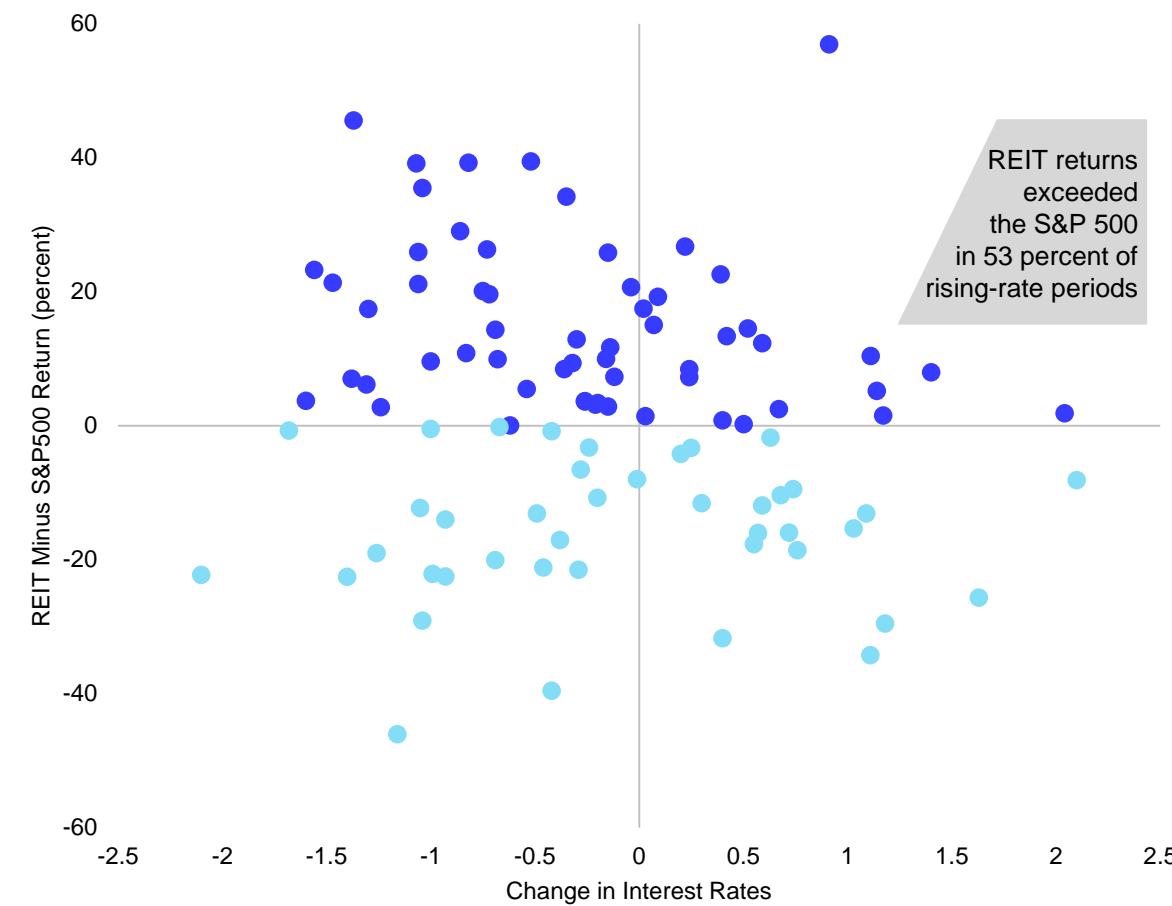
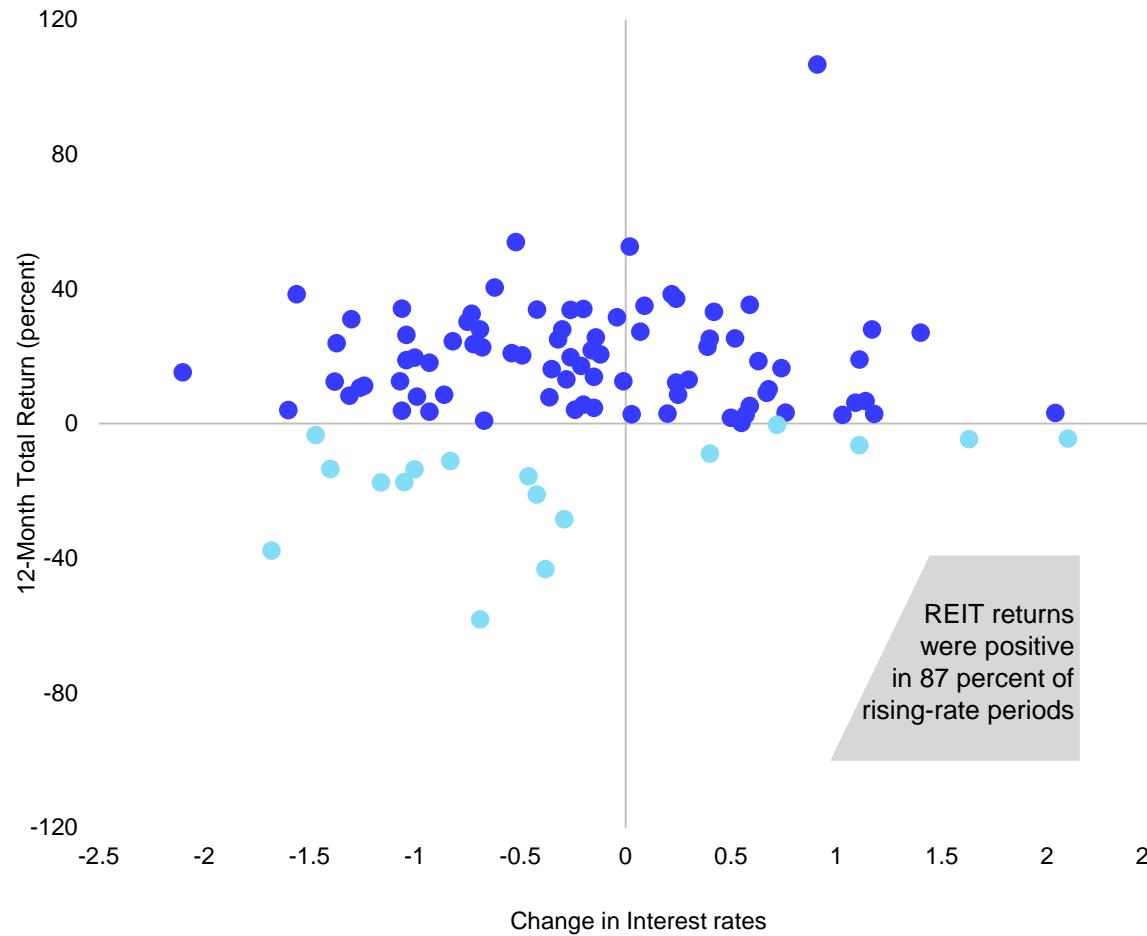


Real Estate Operating Fundamentals Remain Favorable

- Net absorption (i.e. growth of demand) exceeds new supply for most property types in most markets.
- New construction is in check and vacancy rates are low, supporting modest increases in rents.



REITs Have Often Outperformed the Broad Stock Market During Periods of Rising Interest Rates



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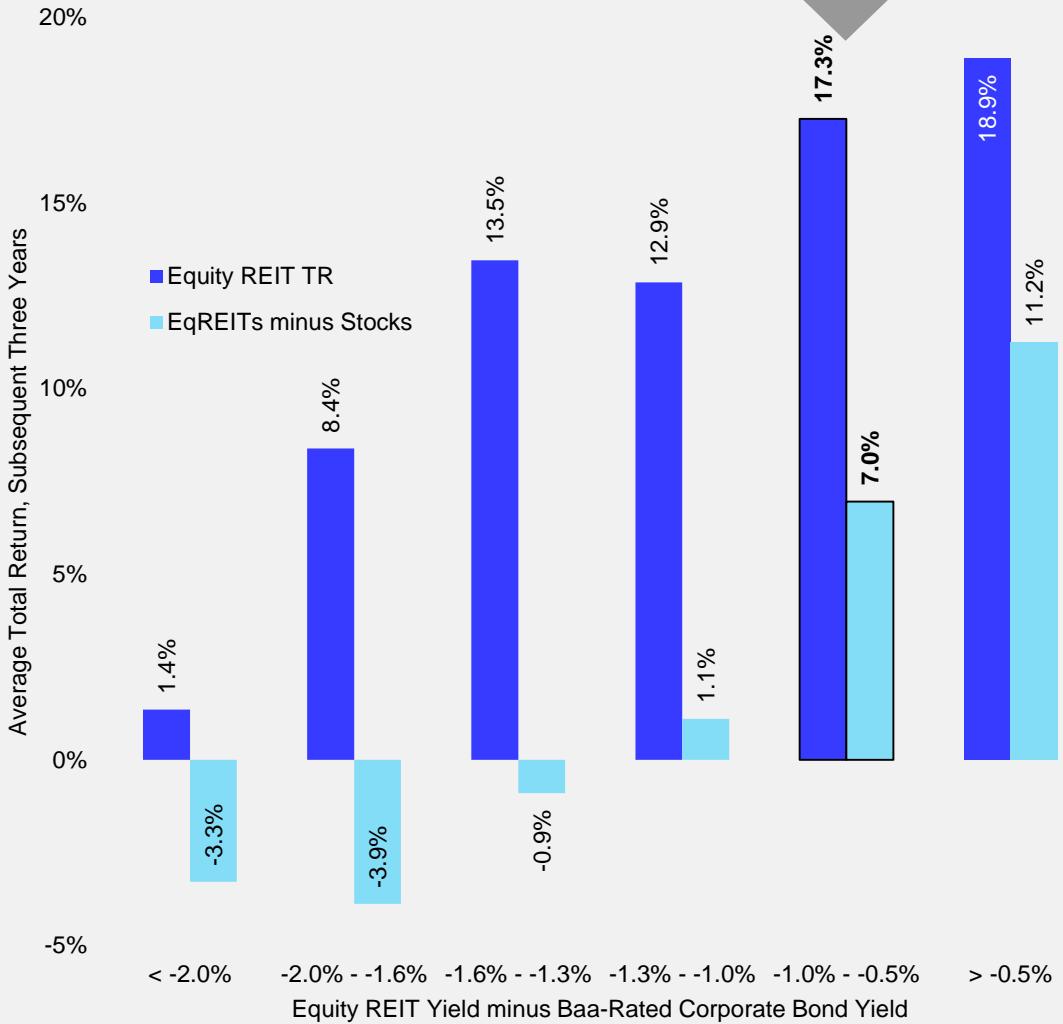
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Dividend Yield Spreads have Signaled Future REIT Performance

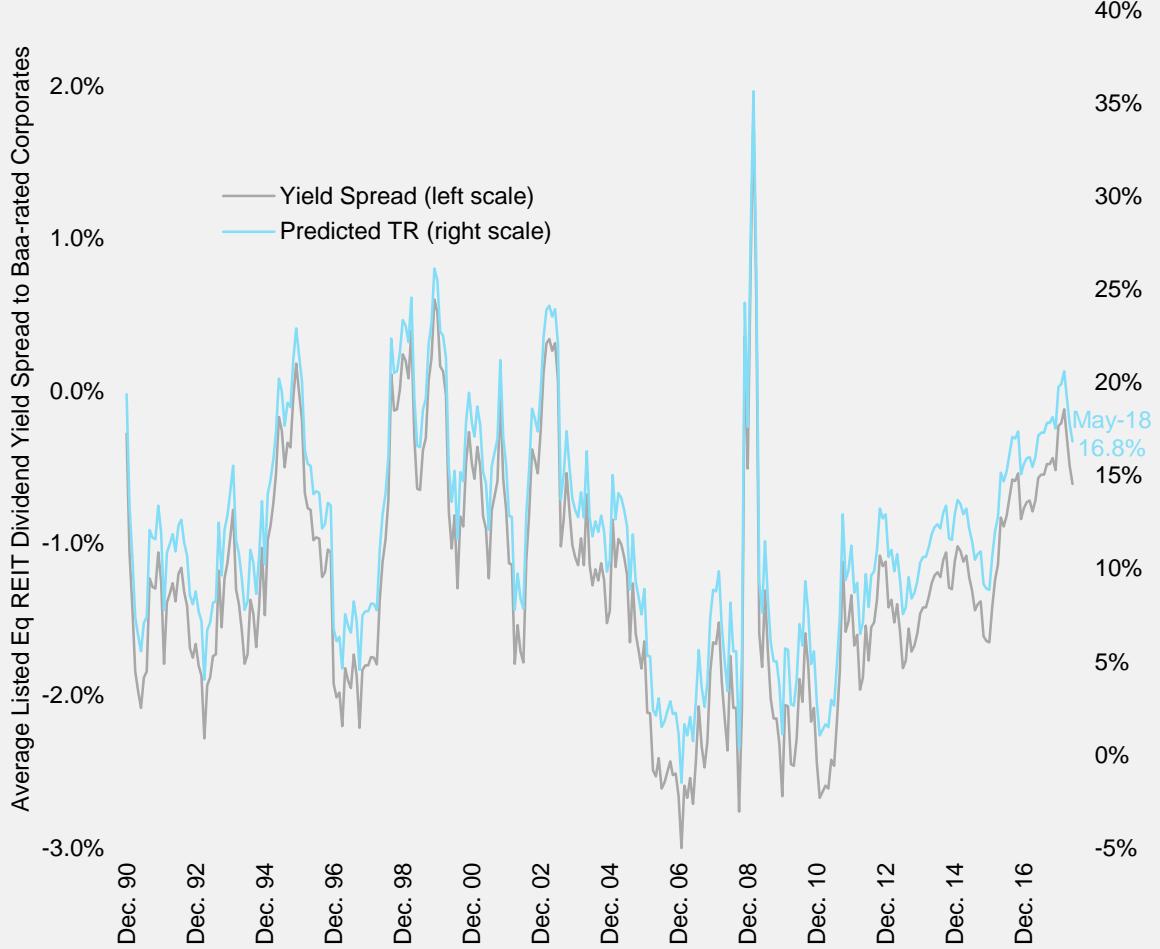
- The spread between average REIT dividend yields and the yields on other income-oriented investments has provided a valuable signal for future REIT total returns *and* for future REIT outperformance relative to the broad stock market.
 - Yield spread to Baa-rated corporates (shown)
 - Yield spread to high-quality corporates
 - Yield spread to 10-year Treasuries
- Current REIT dividend yield spreads are relatively high, suggesting strong future REIT total returns *and* strong future REIT outperformance relative to the broad stock market.



Source: Nareit analysis of monthly total returns from the FTSE Nareit All Equity REIT Index and Russell 3000 stock index, December 1990 – May 2018; yield spread is month-end average equity REIT yield minus month-end market yield on Moody's Baa-rated bonds (via FRED).

Regression Analysis Also Suggests Bullish Future REIT Return Expectations

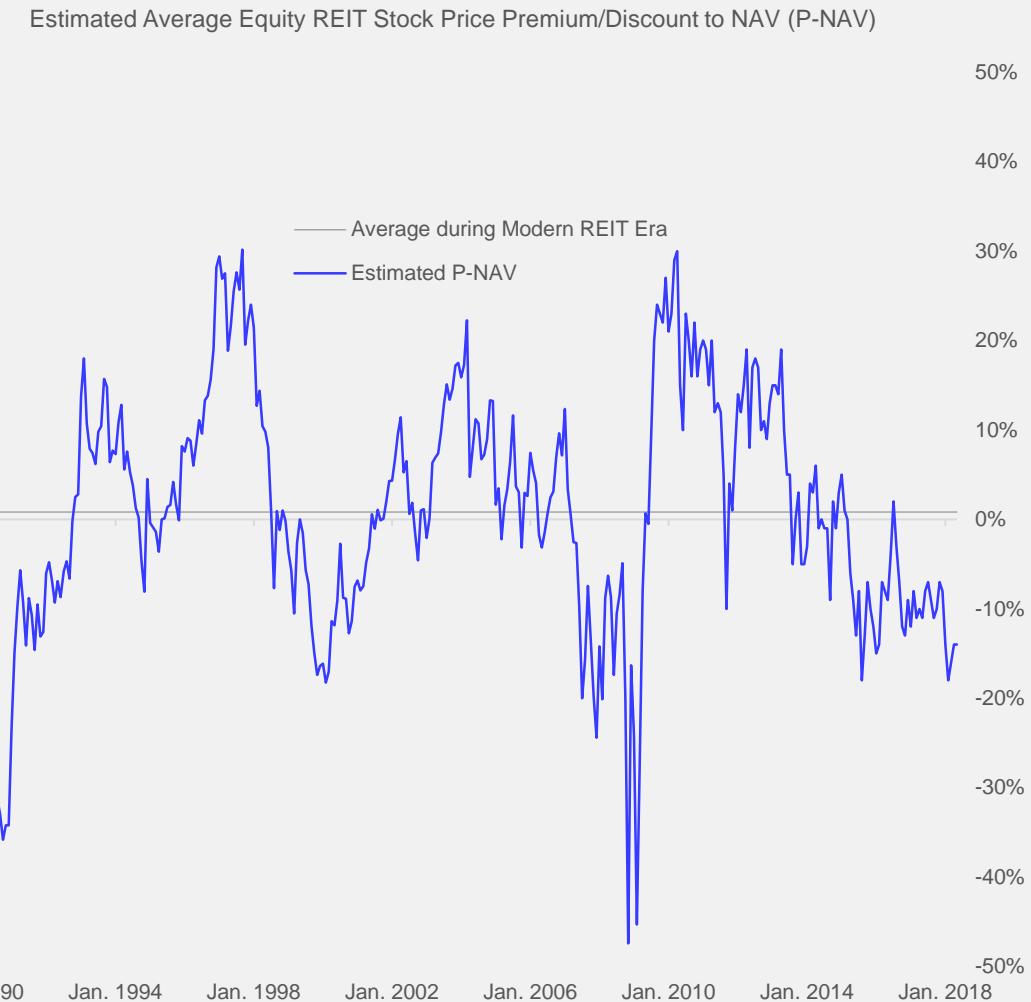
- Regression suggests that average annualized returns over subsequent three-year periods have generally been about 21.6 percent plus 7.68 times the yield spread to high-yield corporates.
- The -0.61 percent yield spread at the beginning of June 2018 suggests that equity REIT returns will average around 17 percent per year over the next three years and outperform the broad stock market by around six percentage points per year.
- The analysis provides qualitatively similar conclusions for yield spreads to other assets, and for future periods other than the next three years.



Source: Nareit analysis of monthly total returns from the FTSE Nareit All Equity REIT Index and Russell 3000 stock index, December 1990 – May 2018; yield spread is month-end average equity REIT yield minus month-end market yield on Moody's Baa-rated bonds (via FRED).

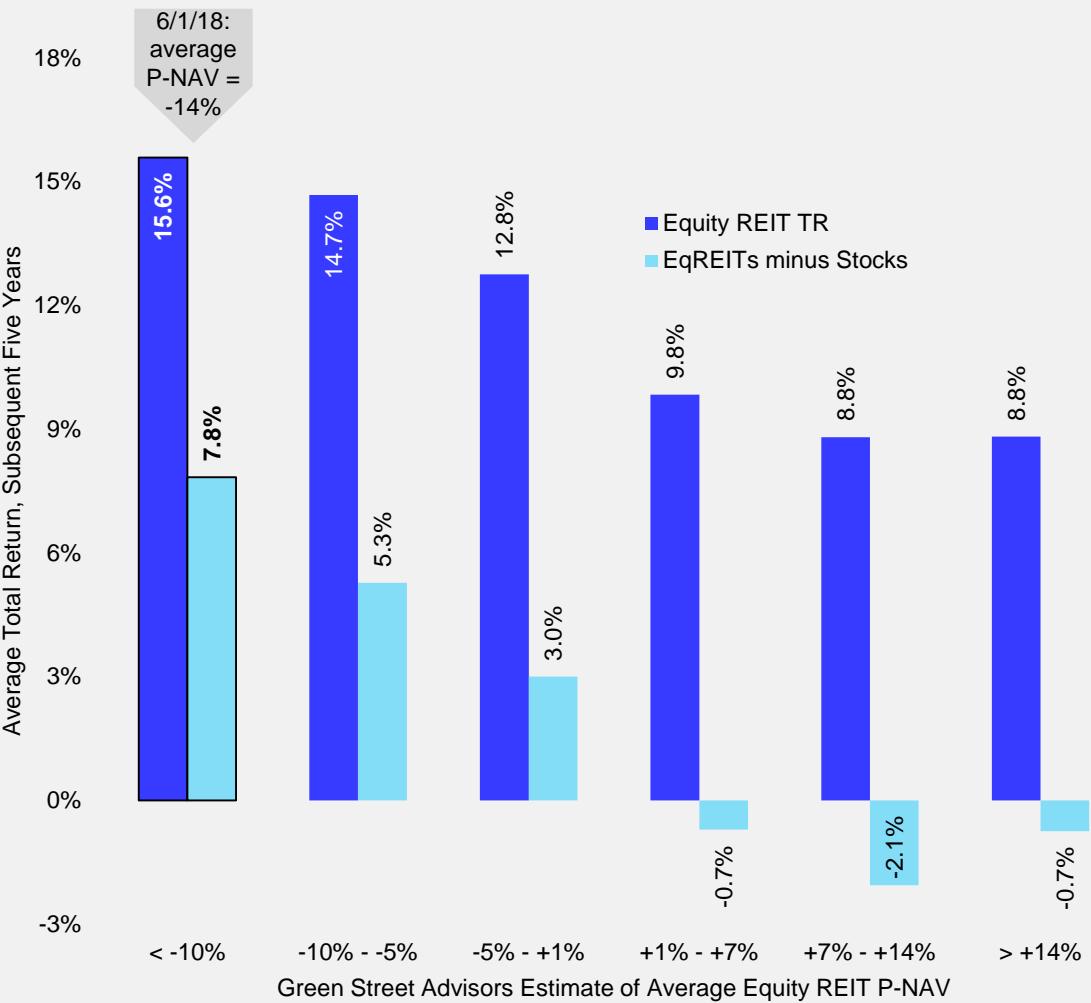
Public Real Estate Seems Inexpensive Relative to Private Real Estate

- “On average, REITs have traded roughly at parity relative to asset value/NAV over the last twenty+ years. Based on prevailing share prices and the resultant observed premium/discount, public-market investors are effectively assuming that real estate values will change by -9%.”
- “Assuming that unlevered property values revert to their long-term relationship relative to fixed-income alternatives, REIT share prices should change by +11%.”



Equity REIT Premiums to Net Asset Value Also Signal Future Performance

- The average equity REIT stock price premium / discount to estimated net asset value (P-NAV) has provided a valuable signal for future REIT total returns *and* for future REIT outperformance relative to the broad stock market.
- Current REIT stock prices are abnormally low relative to net asset value, suggesting strong future REIT total returns *and* strong future REIT outperformance relative to the broad stock market.



Source: Nareit analysis of monthly total returns from the FTSE Nareit All Equity REIT Index and Russell 3000 stock index, December 1990 – May 2018; yield spread is month-end average equity REIT yield minus month-end market yield on Moody's Baa-rated bonds (via FRED).

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- Current REIT valuations ✓ all metrics seem to be in distinctly bullish ranges



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REITs: Looking Back on 2017 and Looking Forward to 2018



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