Carpathian
Capital Management

WHITE PAPER · PRIVATE REAL ESTATE

Structurally Independent

What 10 years of quarterly returns reveal about how private real estate behaves relative to other asset classes, where the diversification benefit holds up under scrutiny, and where the data has limits.

Carpathian Capital Management
May 2026

We lose sleep over your money.

EXECUTIVE SUMMARY

What the data shows

KEY FINDINGS

- Over 10 years of quarterly returns, private real estate is **negatively correlated with stocks, bonds, and cash**, and **approximately uncorrelated with REITs**. No other asset class in the standard allocation toolkit shows this profile.
- Three separate correlation matrices using different proxies (TIAA Real Estate Account, the NCREIF Property Index, and Carpathian Capital Management's NFI-ODCE replication) produce **directionally identical results**.
- Private real estate and REITs delivered nearly identical 10-year annualized returns (**4.9% each**), but REITs have a 0.76 to 0.79 correlation with the S&P 500. REITs function as equity exposure with a real-estate-sector tilt, not as real estate diversification.
- The strongest relationship in the matrix is between private real estate and cash (**−0.67 to −0.72**), driven by a mechanical link: when the risk-free rate rises, cash yields rise and cap rates expand, pushing property values down. The dynamic reverses when rates fall.
- Appraisal smoothing affects the magnitude of the volatility and correlation figures. The directional findings hold across smoothed and unsmoothed measures, but the magnitudes are partially measurement-driven. Section IV addresses this directly.
- Every figure in this paper is independently verifiable from the cited sources. The complete replication workbook is available on request.

SECTION I

The Premise

Most advisors evaluate private real estate by looking at returns first. Returns are easy to compare, easy to benchmark, and easy to explain to a client. But returns are only half the picture. The other half is how an asset behaves relative to everything else in the portfolio.

Correlation measures that. And when you look at private real estate's correlation to stocks, bonds, cash, and REITs over a 10-year period of quarterly returns, the result is unusual: private real estate is negatively correlated with stocks, bonds, and cash, and approximately uncorrelated with REITs. Not slightly. Meaningfully. Across multiple indices and time periods.

No other asset class in the standard allocation toolkit produces that combination. Stocks and bonds have periods of positive and negative correlation. REITs track closely with equities. Cash is uncorrelated with most things but does not generate real returns. Private real estate is the only asset class in the matrix that combines negative correlation with stocks, bonds, and cash with approximately zero correlation to REITs, consistently, for a decade.

This paper presents that data, explains the mechanics behind it, addresses the most common objection, and makes everything independently verifiable. Every number comes from publicly available sources. An advisor can replicate the entire study with a Bloomberg terminal or a spreadsheet.

SECTION II

The Data

Two organizations published the same conclusion independently.

The first is TIAA, which publishes a correlation study quarterly as part of its Real Estate Account FAQ. The study covers the ten-year period ending September 30, 2025,[1] uses quarterly total returns,[2] and sources index data from FactSet and NCREIF. The TIAA Real Estate Account is a $22.7 billion diversified portfolio of directly owned properties.[3][4]

The TIAA FAQ contains two correlation matrices. The first uses the TIAA Real Estate Account itself, a fund-level return series that includes leverage, fees, and cash holdings. The second uses the NCREIF Property Index (NPI), which measures unleveraged, gross-of-fee returns at the individual property level.[5]

Correlation Matrix A: TIAA Real Estate Account

Ten-year period ending September 30, 2025 · Quarterly total returns · Fund-level

	Private RE	Stocks	Bonds	Cash	REITs	Index
Private RE	1.00	-0.28	-0.36	-0.68	-0.05	TIAA Real Estate Account
Stocks	-0.28	1.00	+0.31	+0.08	+0.76	S&P 500 Index
Bonds	-0.36	+0.31	1.00	+0.24	+0.53	Bloomberg U.S. Agg Bond
Cash	-0.68	+0.08	+0.24	1.00	-0.03	FTSE 3-Month Treasury
REITs	-0.05	+0.76	+0.53	-0.03	1.00	FTSE NAREIT All Equity REITs

Source: TIAA Real Estate Account FAQ, Exhibit 99.1 (Sep 30, 2025). Index data: FactSet, NCREIF.

Figure 1. Correlation matrix using the TIAA Real Estate Account — fund-level returns, ten-year period ending Sep 30, 2025.

Correlation Matrix B: NCREIF Property Index (NPI)

Ten-year period ending September 30, 2025 · Quarterly total returns · Property-level, unleveraged

	Private RE	Stocks	Bonds	Cash	REITs	Index
Private RE	1.00	-0.22	-0.32	-0.67	+0.01	NCREIF Property Index (NPI)
Stocks	-0.22	1.00	+0.31	+0.08	+0.76	S&P 500 Index
Bonds	-0.32	+0.31	1.00	+0.24	+0.53	Bloomberg U.S. Agg Bond
Cash	-0.67	+0.08	+0.24	1.00	-0.03	FTSE 3-Month Treasury
REITs	+0.01	+0.76	+0.53	-0.03	1.00	FTSE NAREIT All Equity REITs

Source: TIAA Real Estate Account FAQ, Exhibit 99.1 (Sep 30, 2025). Index data: FactSet, NCREIF.

Figure 2. Correlation matrix using the NCREIF Property Index (NPI) — unleveraged, gross-of-fee, property-level.

The third matrix was built independently by Carpathian Capital Management using the NFI-ODCE (net returns), covering Q1 2015 through Q4 2024. The NFI-ODCE is the NCREIF Fund Index for Open End Diversified Core Equity, a capitalization-weighted index of 25 institutional private real estate funds with roughly $278 billion in gross assets.[67]

Correlation Matrix C: CCM Independent Replication (NFI-ODCE)

Q1 2015 through Q4 2024 · 40 quarters · Net returns · Excel CORREL()

	Private RE	Stocks	Bonds	Cash	REITs	Index
Private RE	1.00	-0.31	-0.38	-0.72	-0.10	NFI-ODCE (Net Returns)
Stocks	-0.31	1.00	+0.32	+0.10	+0.79	S&P 500 Total Return
Bonds	-0.38	+0.32	1.00	+0.17	+0.50	Bloomberg U.S. Agg Bond
Cash	-0.72	+0.10	+0.17	1.00	+0.01	3-Month T-Bill (FRED)
REITs	-0.10	+0.79	+0.50	+0.01	1.00	FTSE NAREIT All Equity REITs

Source: CCM analysis. NFI-ODCE from NCREIF via USQ Capital Partners (Q4 2024).
Other indices: S&P Dow Jones, Bloomberg L.P., U.S. Treasury (FRED), NAREIT.

Figure 3. CCM-built correlation matrix using NFI-ODCE net returns, Q1 2015 through Q4 2024.

The results across all three matrices are directionally identical.

What the matrices show

Private real estate is negatively correlated with stocks, bonds, and cash across all three matrices. Against REITs, the correlation is approximately zero (TIAA REA: −0.05; NPI: +0.01; ODCE: −0.10). No other asset class in the matrix shares that profile.

−0.05
TIAA REA

+0.01
NCREIF NPI

−0.10
NFI-ODCE

Private real estate × REITs — three independent matrices, the same near-zero result.

Against stocks

TIAA REA: −0.28.[8] NPI: −0.22.[9] ODCE: −0.31.[10]

When stock returns rise, private real estate returns have historically tended to move in the opposite direction. The correlation is moderate, not extreme, which reflects the fact that broad economic conditions like GDP growth and employment affect both asset classes. But the direction is negative, meaning the two assets respond differently to those conditions. Part of the reason is mechanical: equity selloffs often coincide with periods when the Federal Reserve is cutting interest rates to support a slowing economy. Lower rates compress cap rates, which raises real estate values (cap rate equals net operating income divided by property value, so a

lower cap rate means a higher value for the same income). The same macro environment that pressures stocks can be a tailwind for real estate. The structural reason behind the negative correlation: stock returns are driven by earnings multiples, market sentiment, and trading flows. Private real estate returns are driven by contractual rental income, local property fundamentals, and cap rates that respond to interest rates. These are different engines.

Against bonds

TIAA REA: −0.36.[11] NPI: −0.32.[12] ODCE: −0.38.[13]

Private real estate is not a fixed income substitute, and it does not track with the bond market. Over the ten years ending December 31, 2023, the Bloomberg U.S. Aggregate Bond Index earned just 1.8% annualized, barely above cash and below the rate of inflation over the same period.[14][15]

Against cash

TIAA REA: −0.68.[16] NPI: −0.67.[17] ODCE: −0.72.[18]

This is the strongest relationship in the matrix, and it has a specific mechanical explanation. Cash returns are essentially the short-term risk-free rate. When the risk-free rate rises, T-bill yields rise and cash returns go up. At the same time, investors demand higher cap rates on real estate (cap rate equals net operating income divided by property value), which mathematically means lower property values for the same income. The two assets move in opposite directions because they respond to the same input, the risk-free rate, in opposite ways. When rates fall, the dynamic reverses: cash yields drop and real estate values rise as cap rates compress. The 2022 to 2024 tightening cycle was a clear example of the first direction; the prior decade of low rates was a clear example of the second.

Against REITs

TIAA REA: −0.05.[19] NPI: 0.01.[20] ODCE: −0.10.[21]

Near zero. For an advisor who currently counts a REIT allocation as real estate exposure, this is the number worth sitting with. Public and private real estate, despite owning similar types of physical properties, do not behave as the same asset class from a portfolio construction standpoint. Meanwhile, REITs show a **0.76 correlation with the S&P 500.**[22] That means a REIT allocation is providing equity-like behavior, not real estate diversification.

Three separate matrices. Three different private real estate proxies: a single fund (TIAA REA), a property-level index (NPI), and a 25-fund institutional index (ODCE). Slightly different time periods, slightly different measurement approaches. Every correlation falls within a narrow range across all three. This is not a coincidence. It reflects a structural reality about how private real estate generates returns.

Those returns come from contractual rental income and physical asset appreciation driven by local supply and demand. A lease signed with a tenant generates cash flow on a schedule that has nothing to do with what the S&P 500 did this quarter. A property's value is appraised based on comparable sales, rent rolls, and capitalization rates in its specific market. These are fundamentally different return drivers, and the negative correlations in the data are a reflection of that fundamental difference.

SECTION III

Same Return, Different Experience

Correlation measures direction. It answers the question: when one asset goes up, does the other go up or down? But it does not measure magnitude. Two assets can be perfectly correlated and still have wildly different volatility profiles.

That is why the return and risk comparison over the same period is not a separate argument from the correlation data. It is the same argument viewed from a second angle.

Return and Risk Comparison

Q1 2015 through Q4 2024 · 10-year period · 40 quarters

Asset Class	Annualized Return	Quarterly Std Dev	Annualized Std Dev	Correlation to S 500
Private RE (ODCE)	4.9%	2.8%	5.6%	-0.31
REITs (NAREIT)	4.9%	9.3%	18.7%	+0.79
Stocks (S 500)	13.1%	7.8%	15.7%	1.00
Bonds (Bloomberg Agg)	1.4%	2.7%	5.3%	+0.32
Cash (3-Mo T-Bill)	1.7%	0.5%	0.9%	+0.10

Private RE and REITs: identical returns. REITs had 3.3x the volatility and moved with stocks (+0.79) while private RE moved against them (-0.31).

Source: CCM analysis. NFI-ODCE (NCREIF), SP 500 TR, Bloomberg U.S. Agg, 3-Mo T-Bill (FRED), FTSE NAREIT All Equity REITs TR.

Figure 4. Return and risk comparison — Q1 2015 through Q4 2024.

Over the ten-year study period (Q1 2015 through Q4 2024), private real estate (ODCE) and REITs (NAREIT All Equity) delivered nearly identical annualized returns: 4.9% for both.[23]

The experience of holding them was not comparable.

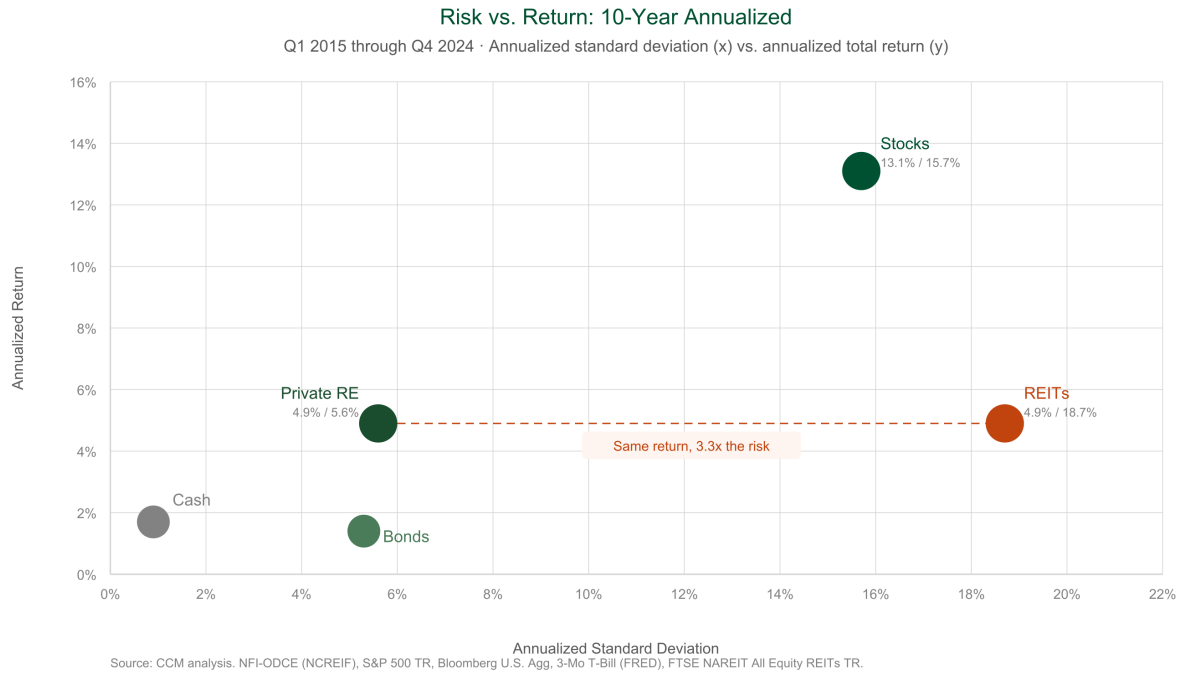

Figure 5. Risk-return scatter — private real estate delivers comparable returns at roughly one-third the quarterly volatility of REITs.

The quarterly standard deviation of private RE was 2.8%. For REITs, it was 9.3%, more than three times higher.[24] And the REIT volatility was not independent: REITs had a 0.79 correlation with stocks over this period,[25] meaning the quarters when REITs fell tended to be the same quarters when the broader equity portfolio fell.

Metric	PRIVATE RE (ODCE)	REITs (NAREIT)
Annualized return	4.9%	4.9%
Quarterly std deviation	2.8%	9.3%
Correlation to stocks	−0.31	+0.79

Same return. Different experience. Source: CCM replication workbook, Q1 2015–Q4 2024.

Private RE, by contrast, showed a −0.31 correlation with stocks.[26] The quarters when equities dropped were frequently the quarters when private RE was flat or positive. That is the portfolio construction case for the asset class: it does not need to beat stocks to improve a

portfolio. It needs to generate a positive return while behaving differently from stocks. Over this period, it did both.

This is consistent with the Brookfield Oaktree Wealth Solutions analysis (data through December 2024): adding a 10% allocation to private U.S. real estate to a traditional 60/40 portfolio historically increased returns while lowering overall portfolio risk over a trailing 20-year period.[27]

An asset that delivers comparable returns to REITs, with materially lower volatility (the smoothing question is addressed in Section IV), and moves opposite to stocks is not just a different version of real estate exposure. It is a different asset class.

SECTION IV

The Smoothing Question

An informed advisor will look at the data in sections II and III and raise a legitimate question: how much of the low volatility and negative correlation is real, and how much is an artifact of how private real estate is measured?

The question deserves a direct answer, because it touches the most common objection to using private real estate in portfolio analysis.

What the objection is

Private real estate indices are not priced by a public market. Properties are generally revalued quarterly based on comparable transactions, cap rates, and property condition. These appraisals produce valuations that change more gradually than daily-traded securities. In the academic literature, this is called “appraisal smoothing” or “return smoothing.”

The effect is documented and real. Because appraisals incorporate prior-quarter information and are inherently conservative estimates, the resulting return series is less volatile than what a hypothetical daily mark-to-market would show.

What smoothing does and does not do

Smoothing compresses the magnitude of correlations and volatility. A “true” daily-priced private RE series would show higher volatility and correlations closer to zero, and the effect is non-trivial. Academic unsmoothing methods (Geltner 1991; Fisher, Geltner & Webb 1994) typically increase reported private RE quarterly volatility by 2x to 3x and move correlations toward zero by 0.10 to 0.20. Applied to this study’s data, the stock correlation likely moves from −0.31 toward roughly −0.10 to −0.15, still diversifying. Quarterly volatility moves from

2.8% toward roughly 6% to 9%, still below REITs at 9.3%, but with a narrower gap. **The directional findings hold. The magnitudes are partially measurement-driven.**

Smoothing does not reverse the direction of correlations. The consistent negative correlations between private RE and public equities have been observed across multiple indices (NPI, ODCE, TIAA REA), multiple time periods, and in studies using transaction-based pricing rather than appraisal-based pricing.[28]

The magnitude is debatable. The direction is established.

The structural explanation holds regardless of measurement frequency

The reason private real estate moves differently from stocks is not a function of how often it is measured. It is a function of how it generates returns.

A 300-unit apartment building in the Midwest generates income from signed leases with individual tenants. That income does not fluctuate because the S&P 500 had a bad week. The property's value is determined by the rent it collects, the occupancy rate it maintains, the capital it requires, and what a buyer would pay based on those fundamentals. These drivers are local, contractual, and physical. They are not the same drivers that move stock prices.

Smoothing does not invent this structural independence. It reflects it imperfectly.

The investor's lived experience

An advisor's client invested in a private real estate fund does not experience daily mark-to-market volatility. They receive quarterly NAV updates based on independent appraisals. They do not see their real estate allocation drop 6% on a Monday because of a geopolitical headline and recover by Thursday. The return series that looks "smoothed" to a researcher is, for the actual investor, the return series they live through.

This is not a trivial point. The behavioral cost of volatility, the anxiety, the temptation to sell at the wrong time, the erosion of conviction, is real and well documented. Investors in private real estate are structurally insulated from that cost, not because the underlying asset is riskless, but because the pricing mechanism does not transmit short-term market noise to the investor's account statement.

Whether you call that a feature or a measurement artifact depends on your frame. From a portfolio construction standpoint, the result is the same: private real estate has historically contributed a return stream that does not move with the rest of the portfolio, and the client holding it has experienced less volatility than the client holding the same economic exposure through public REITs.

> *After 13 years in this business, what surprises advisors most is that the cap-rate mechanic cuts both ways. The same dynamic that hurt private real estate in 2023 is what made it work in the previous decade, and it is the same mechanic that will work again when rates come back down. The correlation profile in this paper is not an accident. It is what you get when an asset's value is set by appraisers using rent rolls and comparable sales, not by traders responding to headlines.*
>
> **— Ian Colville**
> Founder & CEO, Carpathian Capital Management

SECTION V

What This Means for a Portfolio Decision

This is not a prescription. It is a summary of what the data supports and which questions it answers.

For advisors evaluating whether to add private real estate

The correlation data shows private real estate is negatively correlated with stocks, bonds, and cash, and approximately uncorrelated with REITs, over the most recent 10-year period. No other accessible asset class produces that combination. The diversification benefit is not theoretical; it is observable in the data, consistent across three independent indices, and has a structural explanation rooted in how private real estate generates returns.

The implication is straightforward: a portfolio that includes private real estate has historically behaved differently from a portfolio that does not, even when the total return contribution of the private RE allocation was modest. Diversification is not about finding the highest-returning asset. It is about finding the asset whose returns come from different places than everything

else you already own. By that measure, private real estate is the strongest candidate in the standard toolkit.

For advisors who currently allocate to REITs as real estate exposure

The data shows REITs have a 0.76 to 0.79 correlation with stocks[29] and near-zero correlation with private real estate. An advisor modeling a REIT allocation as "real estate diversification" may be overstating the diversification benefit in their portfolio analysis.

This does not mean REITs have no role. It means they function as equity exposure and should be evaluated as such. The diversification benefit that an advisor may be attributing to their REIT allocation is not supported by the correlation data.

For advisors weighing the illiquidity tradeoff

Illiquidity is real. A private real estate allocation cannot be sold on a bad Tuesday. For clients who may need access to the full value of their portfolio on short notice, that is a binding constraint and should be treated as one.

But the correlation data suggests that illiquidity may be part of the reason the diversification benefit exists. Daily-priced real estate (REITs) loses its diversification properties precisely because it is priced by the same market forces as equities. The structural separation from public markets is what creates the return pattern advisors are looking for. The tradeoff is not "good returns in exchange for illiquidity." It is **"genuine diversification in exchange for illiquidity."** Those are different value propositions, and the data helps clarify which one is on the table.

SECTION VI

Verify It Yourself

Every figure in this paper is independently verifiable from the cited sources.

The TIAA Real Estate Account FAQ is updated quarterly and published at tiaa.org. The Nareit publishes index return data through its online market data library. The S&P 500 total return and Bloomberg U.S. Aggregate Bond data are available on any Bloomberg terminal, and the 3-month T-bill rate series is on FRED, the Federal Reserve's public data portal.

Carpathian Capital Management's complete replication workbook, containing all 40 quarters of raw return data for each asset class, live Excel CORREL() formulas, summary statistics, and a methodology tab, is available here. Change the inputs, check the math, draw your own conclusions.

Download the CCM Replication Workbook (Excel) →

The analysis is reproducible from the cited sources and the CCM replication workbook. The decision about what to do with it is the advisor's.

APPENDIX

Methodology and Sources

Study period

Q1 2015 through Q4 2024 (40 quarterly observations) for the CCM replication. Ten-year period ending September 30, 2025 for the TIAA data.

Calculation

Pearson correlation coefficients computed on quarterly total returns. The CCM replication uses Excel CORREL().

Asset class proxies and sources

Asset class	Index	Source
Private RE (TIAA)	TIAA Real Estate Account	tiaa.org — REA FAQ
Private RE (NPI)	NCREIF Property Index	Same TIAA FAQ, Exhibit 99.1
Private RE (CCM)	NFI-ODCE, Net Returns	USQ — NFI-ODCE Fact Sheet Q4 2024
Stocks	S&P 500 Total Return	S&P Dow Jones Indices LLC
Bonds	Bloomberg U.S. Agg Bond	bloomberg.com — 2024 fixed income
Cash	3-Month T-Bill	FRED — TB3MS
REITs	FTSE NAREIT All Eq REITs TR	reit.com — index values

Additional references

Brookfield Oaktree Wealth Solutions. “Private Real Estate.” brookfieldoaktree.com/private-real-estate

LCG Associates. “Bloomberg Aggregate: Then and Now.” March 2024.

CFA Institute Enterprising Investor. “The Interplay Between Cap Rates and Interest Rates.” June 2024.

Workbook availability

The CCM Excel workbook with raw data and live formulas is available for download here.

This paper is for informational purposes only and does not constitute an offer to sell or a solicitation of an offer to buy any security. Past performance is not indicative of future results. An investment cannot be made directly in an index.

NOTES

References & citations

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