RESEARCH INSIGHTS

# Which Way for Appraised Property Values? Looking to Other Real Estate Indices for Clues

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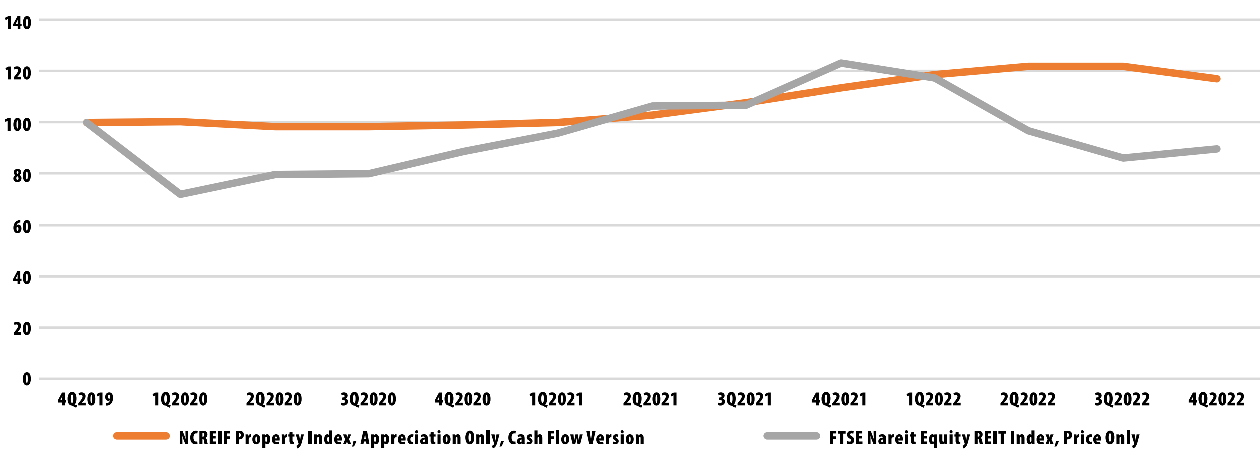
**As transaction activity has dried up in** recent quarters, market participants have been preoccupied with trying to decipher what is happening to property values. With few comps to look at, many have questioned the accuracy of the appraised values underlying private market property portfolios. This is compounded by the fact that, even in times of liquidity, appraisals tend to lag what is happening with actual transaction prices in the market.

Some have looked to the REIT market as a guide to what might actually be happening to values in the private market. Exhibit 1 shows the FTSE Nareit Equity REIT Index plotted against the NCREIF Property Index (NPI). The NPI is an appraisal-based index of institutionally owned real estate, so it can be thought of as a proxy for how institutional private market investors are carrying real estate on their books.[1] Over the past two years, the REIT market showed a much bigger decline as COVID-19 hit, a swifter recovery in values afterward, and a much sharper decline as interest rates and inflation began to rise. REIT values began to decline at the beginning of 2022, as the NPI was still rising, convincing many people that appraised values did not accurately incorporate the current economic environment into values.

Undoubtedly, private market participants can find valuable information in REIT prices, but caveats are in order. First, although changes to REIT prices tend to lead changes in private market valuations, being traded on public exchanges means that REIT prices also include a significant amount of short-term noise. Separating what might be information in REIT prices and what might be noise is difficult and often more art than science. Second, consideration must be given to how different the makeup of the REIT market is compared to the typical private market portfolio. For instance, Exhibit 2 shows the sector breakdown of the FTSE Nareit Equity REIT Index and the NPI. The NPI is constrained, by design, to only office, apartment, retail, industrial, and hotel, with industrial being the largest component at 32%. The five sectors in

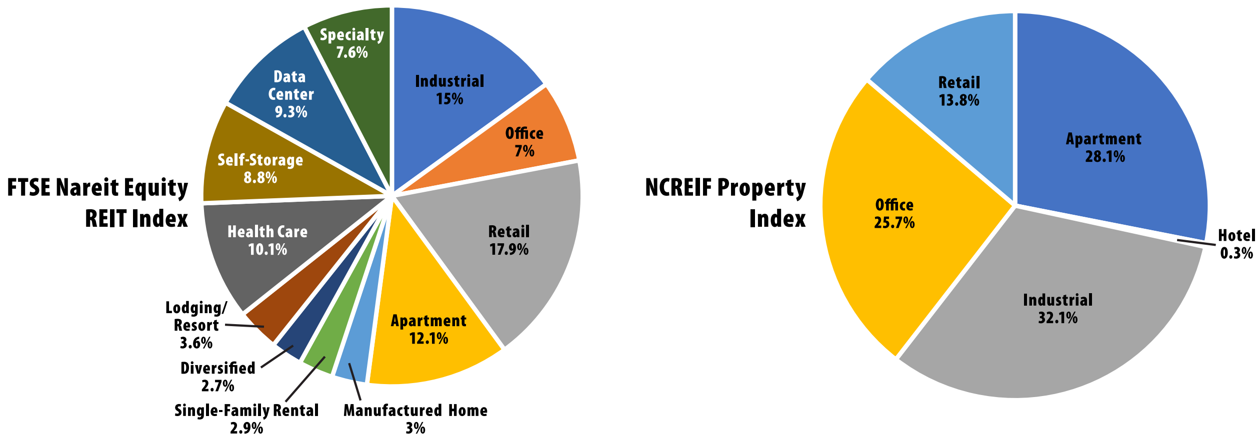
1. In the exhibit and throughout the article, I use the "cash flow version" of the NPI. The standard version of the NPI subtracts capital expenditures from the appreciation return, which means the standard NPI is not directly comparable to indices such the FTSE Nareit or other indices of private market real estate based on transaction prices (actual prices will include increases in value because of capital expenditures). The cash flow NPI shows the appreciation return gross of capital expenditures (and instead subtracts it from the income return), making it more comparable.

**Exhibit 1: NCREIF Values Versus REITs**




**Sources:** PREA Research, NCREIF, Refinitiv Datastream
**Note:** Indices revalued to 100 as of 4Q2019.

**Exhibit 2: Sector Composition of REIT Index Versus NPI, as of Year-End 2022**




**Sources:** NCREIF; REITWatch, Dec. 2022; Nareit

the NPI, however, constitute only 56% of the FTSE Nareit market capitalization, with the remainder being in what private markets often term alternative real estate sectors. Almost half of REIT market cap is in alternative sectors that are not represented at all in the NPI, so judging what "should" be happening to the NPI based on what the REIT index is doing must be done carefully.[2]

## Other Private Market Indices

REIT indices are not the only source of information that may be useful in understanding what is happening in the market. The private real estate market is measured by a number of different indices, of which the NPI is only one. Each index may be calculated differently or be based on a different segment of the market, and hence, each may offer its own unique angle on what is happening in the market. The PREA Research Report "A Primer on Commercial Real Estate Indices" offers an overview of many different indices available that measure the private real estate market and provides a good resource for those wishing to get an idea of what is available and the differences across the various indices.

If each private market index provides a unique look at the market, could these other indices be used to get a better idea of what is happening in the market, just as REITs sometimes are? As an example, consider two indices that are constructed differently than the NPI is and compare them to the NPI—the Green Street Commercial Property Price Index (Green Street CPPI) and the RCA Commercial Property Price Index (RCA CPPI) produced by MSCI. Note that showing these two particular indices against the NPI in no way implies that they are better than other private market indices—every available index has pros and cons. The goal here is to simply see whether other private market real estate indices that show the market from a different angle than the appraisal-based NPI may contain valuable information, and I examine only two of the possible indices, rather than all of them, to keep the analysis manageable and because these two specific indices measure the commercial real estate market in much different ways than the NPI.

The RCA CPPI is a transaction price index, calculated based on prices observed in actual transactions (in particular, the RCA CPPI uses repeat sales, in which the same property has traded more than once, to estimate price changes in the market). Hence, the RCA CPPI tells whether information from property transactions can help explain what may happen to appraisals. The RCA CPPI has two downsides for the purposes here. (1) Because the RCA CPPI depends on transactions that occur in periods such as now with low liquidity, the types of properties that do transact may be different from the norm. That is, when transactions are low, the transactions that the market does see may not be "typical." (2) The RCA CPPI is

2. For a more in-depth discussion of the differences between public and private real estate, see Richard Kalvoda, Robby Tandjung, and Omar Eltorai, "Exploring the Public-Private Gap: When Price and Value Diverge," *PREA Quarterly*, Winter 2023.


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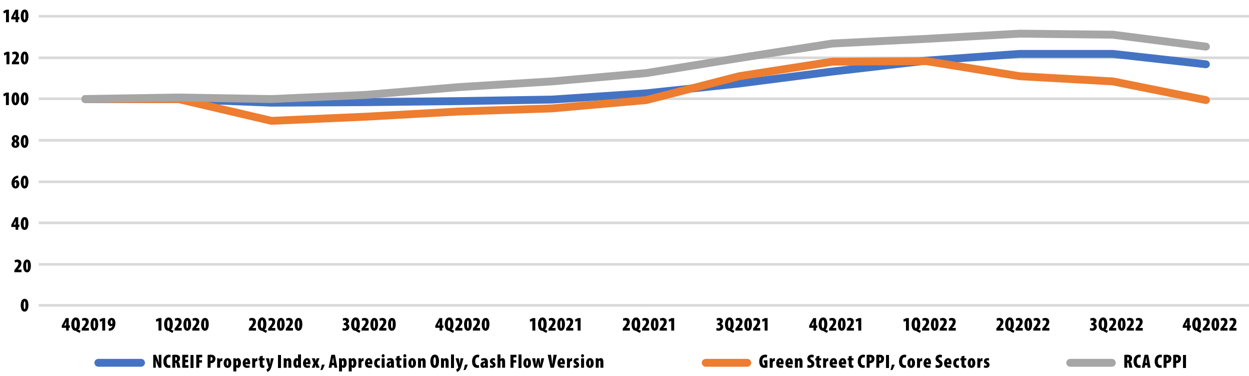
**Exhibit 3: NPI Versus Two Other Private Market Indices**




**Sources:** PREA Research, NCREIF, Green Street, MSCI
**Note:** Indices revalued to 100 as of 4Q2019.

based on all properties that sell valued at more than $2.5 million. This includes many small properties that would not generally be considered for an institutional portfolio, which may limit its relationship to the institutionally owned properties in the NPI.

The Green Street CPPI is based on Green Street's own estimates of the private market values of properties held by REITs. Green Street attempts to update the information used in the value estimates as frequently as possible based on market intelligence. Because the valuations are updated more frequently, this index indicates if current market information not yet reflected in appraisals can help explain what may happen to appraisal-based indices such as the NPI going forward. For this article's purposes, the downside is that the Green Street CPPI is based only on properties held by REITs, which may differ from the types of properties held in institutional portfolios, and is only one part of a large market. To help mitigate this, I use the Green Street Core Sector Index, which includes only properties in the four main sectors (avoiding the heavy weighting on alternative sectors among REITs, as shown in Exhibit 2). Still, even within the four traditional sectors, there may be differences in the types of assets held by REITs versus institutional investors.

Exhibit 3 shows the RCA CPPI and Green Street CPPI plotted against the NPI. (Although both the Green Street CPPI and the RCA CPPI are available on a monthly basis, the exhibit presents them quarterly to match the periodicity of the NPI). The Green Street index began to fall at the beginning of 2022, well before the initial downturn in the NPI. Although the RCA CPPI shows that transaction prices began to fall in 3Q2022, with the decline accelerating in Q4, the overall decline has been muted compared to the losses the Green Street index shows.[3] This is perhaps because of a lack of transactions in the market, which is the basis of the RCA CPPI.

## Can Other Indices Help Predict the NPI?

If appraisals and appraisal-based indices such as the NPI, react slowly to changing market conditions and other indices can provide information on market conditions, then those other indices should help predict appraisal-based indices. If so, they should also help explain what direction a typical institutional real estate portfolio might take in the future, assuming it is somewhat similar in composition to the NPI.

To consider this, I use a statistical analysis to determine if the past returns of other indices are related to current returns on the NPI.[4] Specifically, I look to see if NPI returns are related to past returns on the Green Street CPPI, RCA CPPI, and the FTSE Nareit Equity REIT Index. A complicating factor is that the informationally inefficient real estate market often exhibits momentum—positive (or negative)

3. RCA produces other indices that have shown a greater drop in values, more in line with the Green Street results (in particular, the indices based on hedonic models rather than transaction prices have shown larger declines in value). However, in this article, I want to concentrate on what transaction prices on closed deals reveal, so I analyze only the RCA CPPI.

4. For any math nerds who might be interested, the statistical technique I use is a vector autoregression.

**Exhibit 4: Relationship Between NPI Appreciation Returns and Past Returns on Four Real Estate Indices**

| | Estimated Effect on NPI Appreciation (Cash Flow Version) of 1% Rise in: |
|---|---|
| **NPI Appreciation (Cash Flow Version)** | |
| Last Quarter | 0.34% |
| 2 Quarters Ago | insig. |
| 3 Quarters Ago | insig. |
| 4 Quarters Ago | insig. |
| **FTSE Nareit Equity REIT Index** | |
| Last Quarter | insig. |
| 2 Quarters Ago | insig. |
| 3 Quarters Ago | insig. |
| 4 Quarters Ago | insig. |
| **Green Street CPPI** | |
| Last Quarter | 0.2% |
| 2 Quarters Ago | insig. |
| 3 Quarters Ago | 0.2% |
| 4 Quarters Ago | –0.09% |
| **RCA CPPI** | |
| Last Quarter | 0.41% |
| 2 Quarters Ago | –0.38% |
| 3 Quarters Ago | insig. |
| 4 Quarters Ago | insig. |

**Sources:** PREA Research, NCREIF, MSCI, Green Street, Refinitiv Datastream
**Notes:** "Insig." means a statistical test indicated it could not reliably be judged to be different from zero (using 10% significance level). All coefficients, including insignificant, are used in the forecasts reported later. Data are estimated using quarterly data from 1Q2001 to 4Q2022.

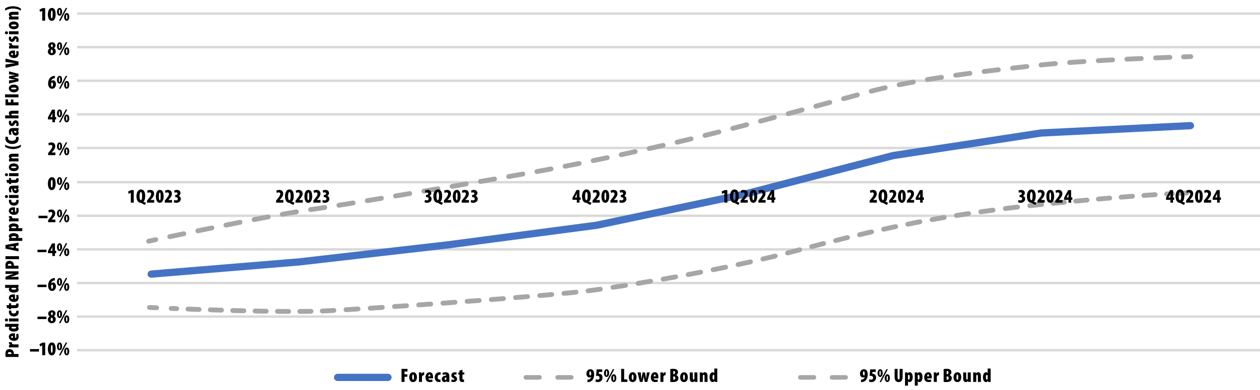
returns in one quarter tend to continue to be positive (or negative) in the next quarter. Because of that, the model includes past values of not only the three other indices but also the NPI itself. The model relates the current quarter's NPI appreciation return to the past four quarters' returns on all the indices. The first quarter of 2001 is when data on all the indices becomes available, so the model is estimated using quarterly data from 1Q2001 to 4Q2022.

The results are presented in Exhibit 4. They show that for every 1% appreciation in the NPI in the past quarter there tends to be 0.34% appreciation this quarter (i.e., the NPI does show momentum in returns), all else being equal. But the other private market indices also contain hints about the future of the NPI. A 1% appreciation in the Green Street CPPI in the previous quarter is associated with a 0.2% appreciation in the NPI this quarter. The Green Street CPPI return from three quarters ago is also related to next quarter's NPI return, and the return four quarters ago has a slightly negative relationship to this quarter's NPI. The RCA CPPI's performance last quarter has a particularly strong relationship to the current NPI return; a 1% rise in the RCA CPPI tends to indicate a 0.41% rise in the NPI going forward. However, that is tempered by the fact that there is a strong negative relationship between the NPI and RCA returns two quarters ago.

An interesting observation is that none of the past returns to the REIT market are judged to be significant by statistical tests. This is, perhaps, not surprising given the documented differences in sector makeup between the REIT world and the NPI. It could also indicate that any useful information from REIT prices is already contained in the Green Street and RCA indices, making REITs somewhat redundant in predicting the direction of the NPI once those indices are included in the model. Whatever the cause, the results indicate, at least at this high-level look at indices diversified across the property types, that REITs do not seem to add much beyond the private market indices to the ability to divine the direction of appraised property values. This may change when I look at specific sectors, which I do in the next section.

If past returns from each index are related to current appreciation on the NPI, then it should be possible to use the model to predict the future direction of the NPI. Although not shown in the exhibit, the statistical technique used actually models the returns of all four indices—i.e., relating past returns on all four indices to current returns of each REIT index, the RCA CPPI, and the Green Street CPPI as well as the NPI. An iterative process can then be used to project out into the future—use the past four quarters to estimate the next quarter, then use that estimate to help predict the following quarter and the next and the next, etc. The results are shown in Exhibit 5. Because these are estimates, a 95% confidence band is also shown (i.e., given the vagaries of estimating these numbers, absolute confidence in the exact number is not possible but can be 95% confident that the truth [at least "truth" as defined by this model] is somewhere between the upper and lower bands). I must point out that this is absolutely not a forecast of the market—it

**Exhibit 5: NPI Quarterly Appreciation Return, Predictions from a Statistical Model Using Only Real Estate Indices**




**Sources:** PREA Research, MSCI, Green Street, Refinitiv Datastream
**Note:** This does not constitute an official forecast; it is simply an example of the results of a statistical model using only past values of real estate indices to predict future appreciation returns to the NPI.

**Exhibit 6: Relationship Between NPI Sector Appreciation and Past Returns on Sector Indices**

| | **Office:** Estimated Effect on Sector Appreciation (Cash Flow Version) of 1% Rise in: | **Apartment:** Estimated Effect on Sector Appreciation (Cash Flow Version) of 1% Rise in: | **Industrial:** Estimated Effect on Sector Appreciation (Cash Flow Version) of 1% Rise in: | **Retail:** Estimated Effect on Sector Appreciation (Cash Flow Version) of 1% Rise in: |
|---|---|---|---|---|
| **NPI Appreciation (Cash Flow Version)** | | | | |
| Last Quarter | 0.43% | 0.68% | 0.4% | 0.23% |
| 2 Quarters Ago | insig. | insig. | insig. | insig. |
| 3 Quarters Ago | insig. | −0.35% | −0.23% | insig. |
| 4 Quarters Ago | insig. | insig. | insig. | insig. |
| **FTSE Nareit Equity REIT Index, Sector Index** | | | | |
| Last Quarter | 0.03% | insig. | insig. | 0.02% |
| 2 Quarters Ago | insig. | insig. | −0.02% | insig. |
| 3 Quarters Ago | insig. | insig. | insig. | insig. |
| 4 Quarters Ago | insig. | insig. | insig. | insig. |
| **Green Street CPPI, Sector Index** | | | | |
| Last Quarter | 0.14% | insig. | 0.19% | 0.13% |
| 2 Quarters Ago | Insig. | insig. | insig. | insig. |
| 3 Quarters Ago | 0.15% | 0.19% | 0.17% | 0.13% |
| 4 Quarters Ago | insig. | insig. | insig. | insig. |
| **RCA CPPI, Sector Index** | | | | |
| Last Quarter | insig. | 0.43% | 0.95% | 0.78% |
| 2 Quarters Ago | insig. | insig. | −0.84% | −1.48% |
| 3 Quarters Ago | insig. | insig. | insig. | 1.18% |
| 4 Quarters Ago | insig. | insig. | insig. | −0.42% |

**Sources:** PREA Research, NCREIF, MSCI, Green Street, Refinitiv Datastream
**Notes:** Each column shows the results from an individual sector and shows the effect of past values of sector indices from the various sources on appreciation returns (cash flow version) to the corresponding NPI sector index. "Insig." means a statistical test indicated it could not reliably be judged to be different from zero (using 10% significance level). All coefficients, including insignificant, are used in the forecasts reported later.

does not incorporate economic or market conditions, cap rates, interest rates, debt availability, or any other important market variable (except to the extent that those things are incorporated in past returns to the indices). The analysis gives an example of what predictions could be made based purely on past values of real estate indices. Any proper forecast of the NPI would need to incorporate many things. But what this does show is that, potentially, one of those things is a look at what other real estate indices have done in the past.

For what it is worth, this simplified approach to predicting the NPI has, as the base case, appraised values continuing to fall throughout 2023 and into 1Q2024, albeit at a decreasing rate over time. Appreciation turns positive in 2Q2024. The upper (more optimistic) bound has property values beginning to

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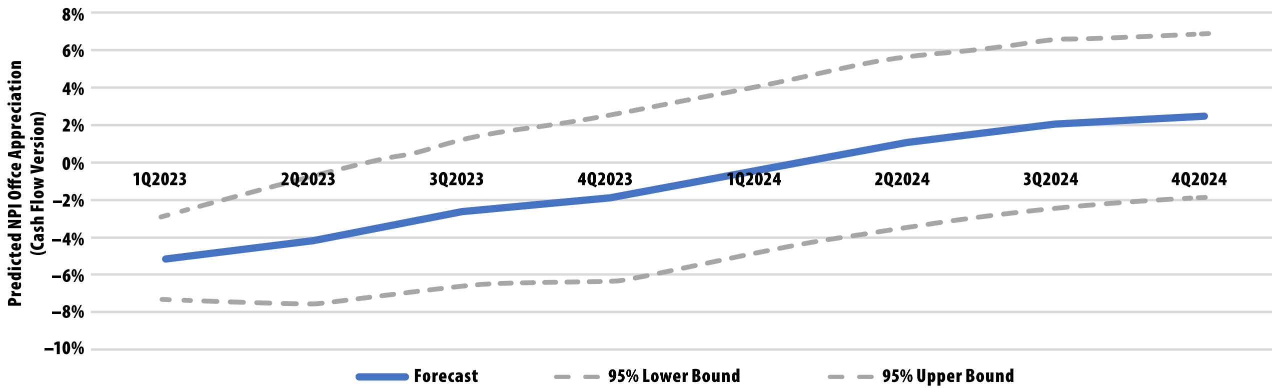
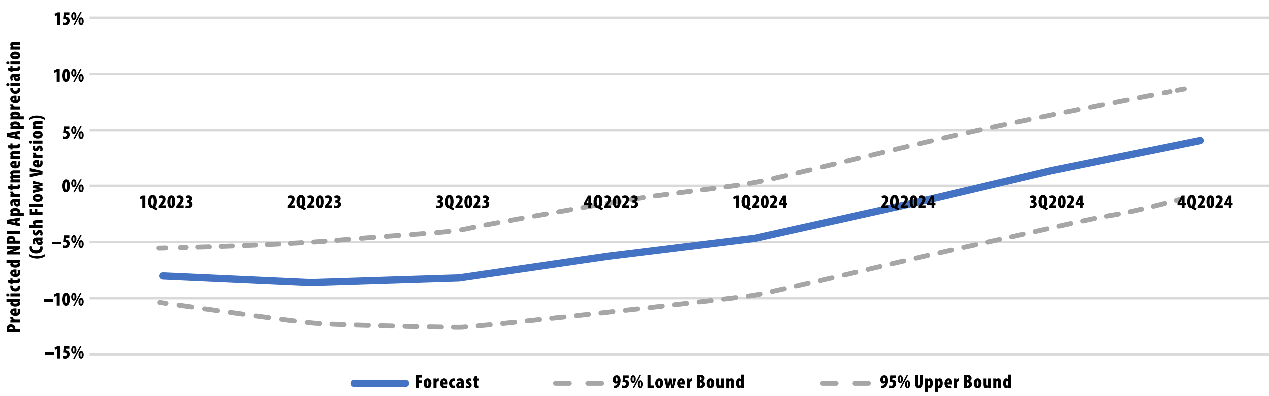
**Exhibit 7: Office—Predictions of NPI Sector Appreciation Based on Statistical Model of Other Sector Indices**




**Sources:** PREA Research, MSCI, Green Street, Refinitiv Datastream
**Note:** This does not constitute an official forecast; it is simply an example of the results of a statistical model using only past values of real estate indices to predict future appreciation returns to the NPI office index.

**Exhibit 8: Apartment—Predictions of NPI Sector Appreciation Based on Statistical Model of Other Sector Indices**




**Sources:** PREA Research, MSCI, Green Street, Refinitiv Datastream
**Note:** This does not constitute an official forecast; it is simply an example of the results of a statistical model using only past values of real estate indices to predict future appreciation returns to the NPI apartment index.

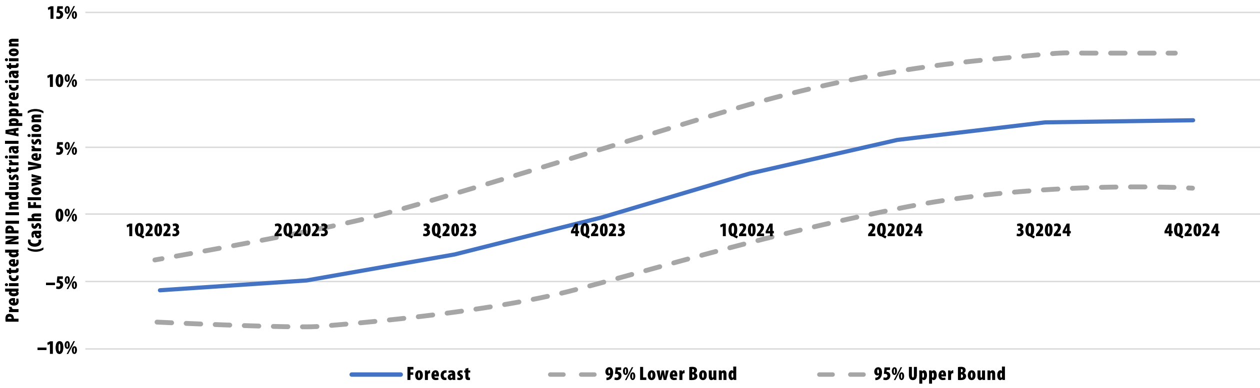
grow again by the fourth quarter of this year, and the lower (pessimistic) bound has values continuing to fall through 2024. For comparison purposes, the most recent (1Q2022) PREA Consensus Forecast, which asks market prognosticators for their forecasts of the NPI, shows the average forecast predicting appreciation of –9.6% on the NPI for 2023, somewhat more optimistic than the simple, pure statistical model here but within its 95% range of likely possibilities.

## Sector Indices

Looking at the relationships between indices for each property sector separately may yield more accurate results. I take appreciation returns (cash flow version) on the NPI for office, apartment, industrial, and retail sectors and repeat the same process as used for the NPI overall but using the relevant sector indices for the Green Street, RCA, and REIT indices. The results are presented in Exhibit 6, and the resulting predictions for NPI appreciation returns on each sector over the next two years are shown in Exhibits 7 through 10.

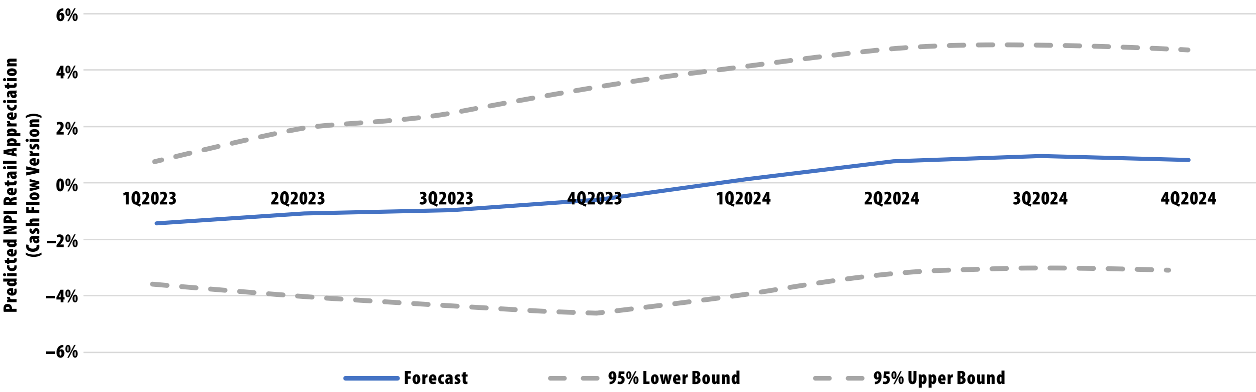
Of note, when looking at sectors separately, past returns on the REIT index do have a relationship with current appreciation returns for three of the four NPI sectors. The lack of significance of the index overall may be related to the much different sector allocations seen in REITs and private real estate portfolios. However, even on a sector level, the relationship between past REIT returns

**Exhibit 9: Industrial—Predictions of NPI Sector Appreciation Based on Statistical Model of Other Sector Indices**




**Sources:** PREA Research, MSCI, Green Street, Refinitiv Datastream
**Note:** This does not constitute an official forecast; it is simply an example of the results of a statistical model using only past values of real estate indices to predict future appreciation returns to the NPI industrial index.

**Exhibit 10: Retail—Predictions of NPI Sector Appreciation Based on Statistical Model of Other Sector Indices**




**Sources:** PREA Research, MSCI, Green Street, Refinitiv Datastream
**Note:** This does not constitute an official forecast; it is simply an example of the results of a statistical model using only past values of real estate indices to predict future appreciation returns to the NPI retail index.

and current NPI returns is fairly weak (and even slightly negative for the industrial sector). The relationships between past sector NPI returns and past REIT returns are much weaker than the relationships between the NPI sector indices and their own past values as well as past values on the RCA and Green Street sector indices.

## Conclusion

The upshot of this analysis is not that this approach is the best, or even an appropriate, way to forecast the direction of the NPI or appraised property values in general. As noted already, a true forecast might incorporate information from past values of these indices but should also incorporate the forecaster's assessment of current and future market conditions. The point here is simply that the REIT market may contain valuable clues to the future direction of the private market (at least on a sector level). But before looking at REITs, investors may want to look at what they can learn from other private market indices beyond the NPI. A number are available, and this article looked at only two—each may have its own part of the story to tell. ■

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