Attributes of Monopolistic REITs

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June 2024

Abstract: This paper explores characteristics of monopolistic real estate investment trusts (REITs), especially in comparison to non-financial corporations as explored by Schleider (2024). Using the Lerner index of monopoly power, I find that REITs are more monopolistic than the average non-financial corporation, but that monopolism is not as consistent or long-lasting. I also show relationships between monopolism and REIT vertical, portfolio occupancy, geographic exposure, and risk. I conclude by exploring REIT risk-adjusted stock market returns and monopoly power.

Introduction

In a country of 2.4 billion acres where real estate is held dispersedly, the 575,000 properties owned by real estate investment trusts, or REITs (NAREIT, 2022), might seem like a drop in the bucket incapable of supporting monopolism. Nonetheless, private markets value public REITs at well over $1 trillion, indicating these properties are especially valuable to the US economy. Given that 35% of the US population rents their dwelling (US Census Bureau, 2022), and real estate operating leases account for billions in company expenditures annually (Learner & Abrams, 2017), I believe a thorough investigation into this industry's market power is warranted.

In this exploratory analysis, I calculate monopoly power of REITs using the Lerner Index at the corporation level. I find that

1. REITs are more monopolistic than the average nonfinancial corporation,
2. REIT monopolism is not as persistent through time as that of nonfinancial corporations (even when excluding the strange effects of COVID-19),
3. Monopolism differs greatly by REIT vertical,
4. The Coronavirus pandemic significantly impacted real estate monopolism in certain verticals,
5. Occupancy and market power are strongly related,
6. Geographic exposure (specifically the Sunbelt) relates strongly with monopoly power in strange ways through time, and
7. Like nonfinancial corporations, REIT risk-adjusted stock market returns are positively related with monopoly power *while the firm is monopolistic*, however
8. Unlike nonfinancial corporations, monopoly power is not a good predictor of future risk-adjusted outperformance.

The next section discusses the limited previous research. Afterwards, I describe my data and methodology. My various findings span six sections. I conclude with observations for commercial real estate practitioners and pointers for future research.

Previous Literature

As stated previously, current research on monopoly power in real estate leaves much to be desired. Like other areas of industrial organization research, simple measures of power like the Hirshman-Herfindahl Index (HHI) and other concentration metrics dominate the literature. Watson and Ziv investigate ownership concentration in Manhattan housing, discovering that rent prices increase with concentration (2021). Du, Chen, and Jarrett examine real estate market power in China via HHI and conclude that concentration does not predict risk-adjusted returns (2014).

I could find only two papers that used the Lerner Index of monopoly power, one of the theoretically strongest measures of market power, to assess monopolism in the real estate space. Robert Hall explored the Lerner index using industry-level data and a Solow model of the firm for 60 NAICS industries. He reports that the US real estate industry has a Lerner index of 0.08 (Hall, 2018). Fukuyama and Tan apply the Lerner index to China's real estate markets, calculating a very high Lerner index of 0.40 for all of China (2022). Like Fukuyama and Tan, I could find no paper that directly examines real estate monopolism in the United States.

Methodology & Data

This paper uses the Lerner index of monopoly power to gauge the market power of a firm, following my analysis of nonfinancial corporations (Schleider, 2024):

> "The Lerner index measures the gap between the price a monopolist charges and marginal cost in economic terms (Elzinga & Mills, 2011)—in addition to the explicit costs reported by firms, economic costs include the expected returns to capital. Theoretically, the Lerner index is the difference between price and marginal cost divided by price, $\frac{P-c}{P}$. The Lerner is superior to other measures of power because it requires no information about the firm's output market or competitors, and it directly captures the economic profit a monopolist should experience (Shaffer & Spierdijk, 2019). Other measures of monopoly power do not capture the economic profit characteristic of a monopoly. Measures of profitability often ignore rents to owners of capital that eat into deceivingly high accounting profit margins. Measures of concentration assume market share is a good proxy for power, but there are competitive market structures that allow for concentration. [...] In short, the Lerner index beats other measures of power because it measures attributes of monopolists regardless as to the market structure.

> "To approximate the Lerner index, I regress accounting profits (earnings before interest and tax, 'EBIT') minus the required return to the firm's invested capital on revenue—the coefficient on revenue is the Lerner estimation. The endogenous variable in this regression represents a firm's economic profit. I calculate the required return percentage with a cost of capital formula that multiplies a risk premium of 7% by the firm's unlevered beta and adds the risk-free rate, measured by the 1-year treasury bond rate. I multiply this required return percentage by invested capital to get a dollar amount to subtract from EBIT. By using the unlevered beta in the required return estimation, we capture the required return to both debt and equity sources of capital."

We estimate the Lerner index using firm-level data on revenues, costs, and invested capital. Let P be the price for a good, c the marginal cost to produce it, and q the produced quantity.

$$\text{Theoretical Lerner Index: } \frac{P-c}{P} > 0 \Rightarrow \text{Monopoly Power}$$

$$\text{Economic Profit: } (EBIT - RR_{IC}) \approx \Pi$$

$$\Pi = Pq - cq - \text{Fixed Costs}$$

$$\Pi = Pq - cq - FC$$

$$\Pi = (P-c)q - FC$$

$$\Pi = \left(\frac{P-c}{P}\right) Pq - FC$$

Estimation for Lerner:

$$(EBIT_t - RR_{IC,t}) = c_0 + m_1(\text{Revenue}_t), \qquad m_1 = \text{Lerner}$$

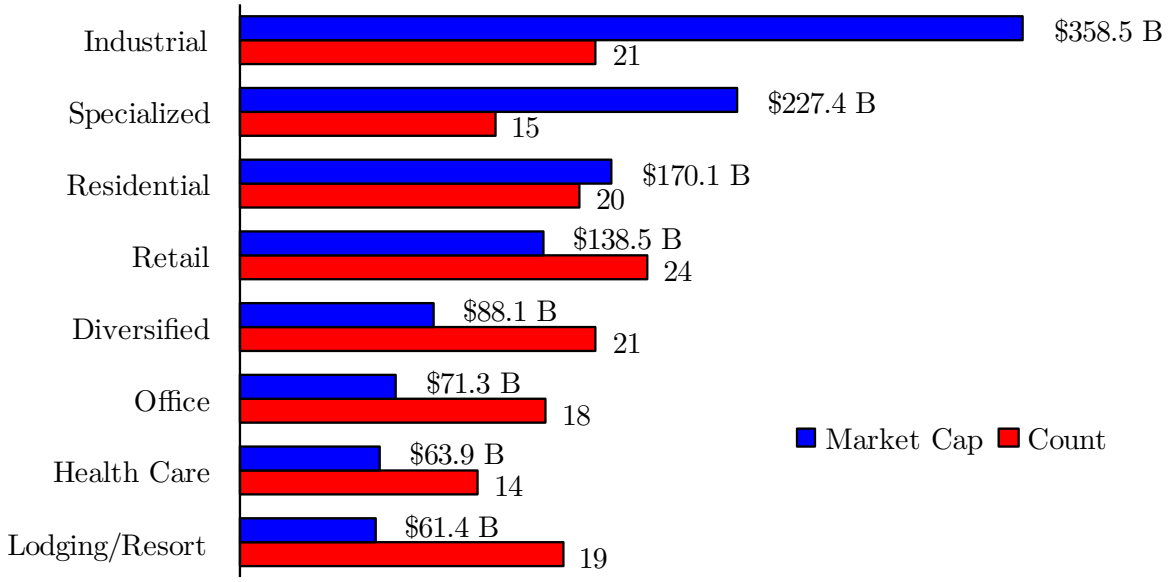
$$RR_{IC} = (7\% \times \beta_{UL} + r_f) \times IC$$

$$IC = \text{Balance Sheet Debt} + \text{Balance Sheet Equity}$$

One can imagine the Lerner index as a "marginal economic profit margin": for each additional dollar of revenue, it indicates how many cents go to monopoly profits. In a commercial real estate context, it describes how much economic profit a landlord gets for each *additional* lease. With real estate, the other measures of power face greater limitations. Since REITs typically own the land they rent out, their required return to investors is their main expense, which makes accounting measures of monopoly power useless. Concentration measures of power are difficult to calculate given the disperse ownership and multiple uses of US real estate. Thus, the Lerner index might be the only appropriate metric with which to measure monopolism in this industry.

I use quarterly financial data from S&P's Compustat IQ accessed via the Wharton Research Data Services. I perform 20-quarter (5-year) rolling regressions for each firm and each quarter to find the Lerner index from 2012 to 2023. I categorized each of the 152 REITs into one of the following verticals using explicit categorizations from NAREIT or best judgment if such categorization was not available: Diversified, Health Care, Industrial (which includes Data Center and Self-Storage), Lodging/Resort (which includes Gaming), Office, Residential, Retail, and Specialized (which includes Ground, Timberland, and Telecommunications). I consolidated some categories into others to avoid sparsely populated niche categories that would impact the results. Figure 1 shows the size of each vertical by number of firms and aggregate market capitalization. I gathered state exposure and occupancy data from public REITs' December 31, 2023 financial filings (10K), or another close date if that was not available.

Figure 1: REIT Distribution by Vertical



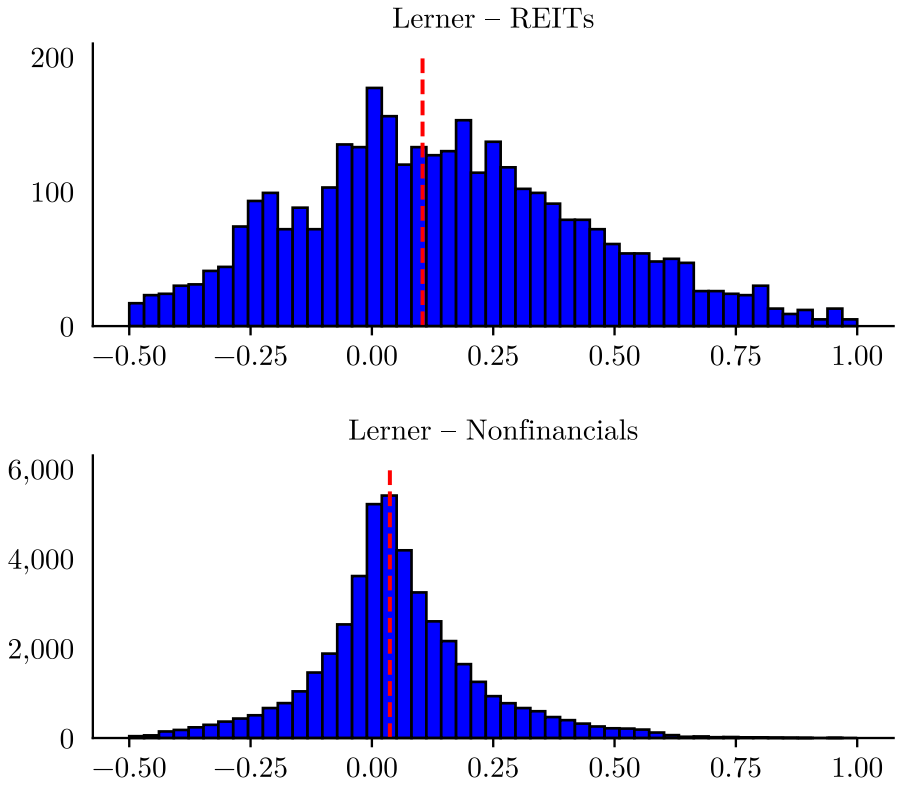
REIT Monopoly Power

REITs are more than twice as monopolistic as the average nonfinancial corporation, but with much more variance. The higher Lerner might be related to REITs lower systematic risk—REITs have a median unlevered beta of 0.53, far lower than that of the median nonfinancial corporation of 0.94. Both Table 1 and Figure 2 compare the Lerner index distributions for nonfinancials and REITs.

Table 1: Lerner Index Descriptive Statistics for REITs and Nonfinancials

Lerner	REITs	Nonfinancials
Mean	0.108	0.051
Std. Dev	0.439	0.171
Minimum	-1.730	-0.624
25th Percentile	-0.113	-0.034
Median	0.104	0.037
75th Percentile	0.339	0.131
Maximum	2.737	0.947

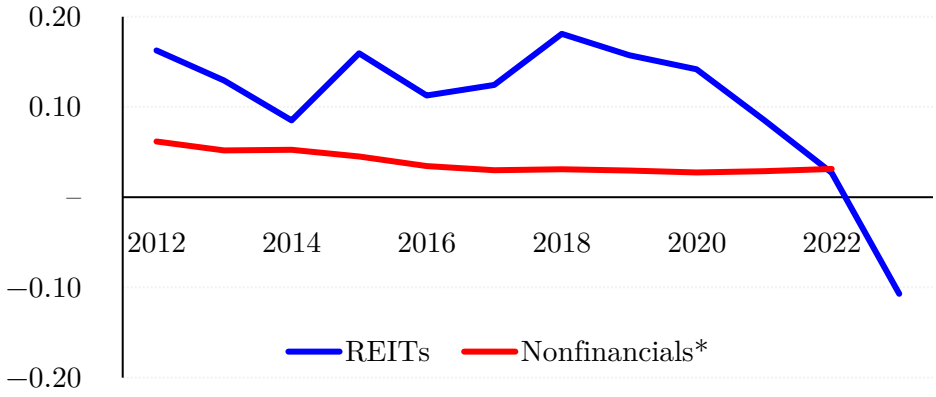
Figure 2: Lerner Index Histograms for REITs and Nonfinancials



Persistence of REIT Monopolism

REITs are not as consistently monopolistic as nonfinancial corporations. As indicated by the histograms in Figure 2, we see a much broader distribution. This invites us to examine how monopolism has changed with time. Figure 3 shows REITs' Lerner indices vary with time more than those of nonfinancials. The Coronavirus pandemic especially impacted REIT monopolism.

Figure 3: Lerner Index through Time versus Nonfinancials



* "Systematic Risk and Measures of Monopoly Power" (Schleider, 2024) only examined nonfinancial corporations from 2012 to 2022.

Table 2: Autoregressive Analysis of REIT and Nonfinancial Corporation Monopolism

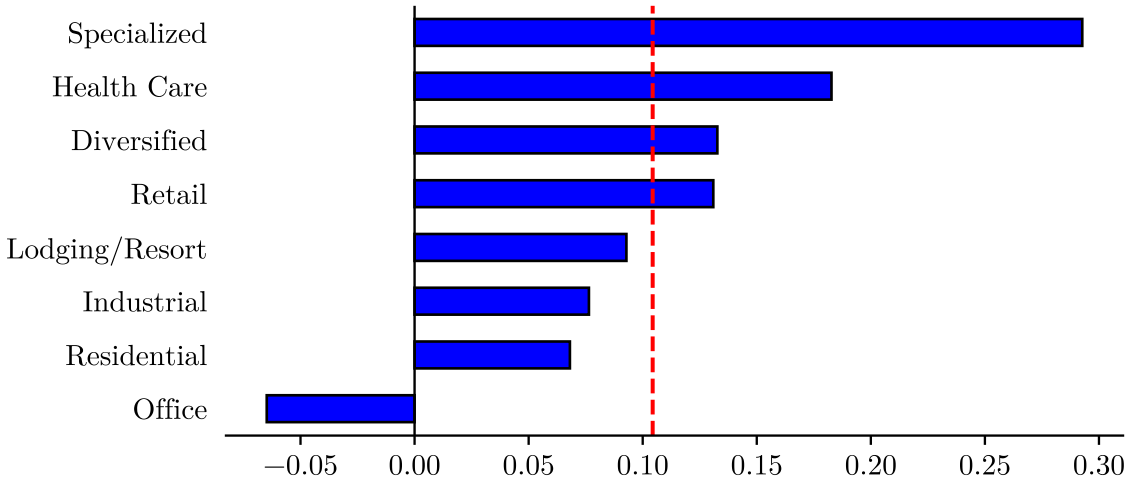
	REITs (incl. COVID)	REITs (excl. COVID)	Nonfinancials
5yr AR Coef.	0.152 ***	0.096 ***	0.249 ***
	(0.014)	(0.016)	(0.006)
Intercept	0.080 ***	0.167 ***	0.015 ***
	(0.007)	(0.010)	(0.001)

REIT monopolism is just as unpredictable at the firm level. I performed simple bivariate autoregressive analysis on REITs' and nonfinancial firms' Lerner indices with a 5-year lag. Table 2 reports these results: though REIT monopoly levels are likely to settle at much higher values than nonfinancials, the autoregressive coefficient shows that REITs only keep 15% of their monopoly power five years into the future, while nonfinancials keep 25%. Even when excluding the effects of COVID, we see a similar level of REIT monopolism persistence. These unpredictable fluctuations in monopoly power might indicate difficulty entering and exiting the market—in other words, industry-wide inelastic supply. In such a market, changes in demand result in substantial changes in price but minor change in the quantity supplied. Previous research from the RAND Corporation indicates the real estate supply is indeed inelastic with respect to price (Rydell, 1982), and supply elasticity aligns with commercial real estate commentators' observations on COVID's effects.

Monopolism by REIT Vertical

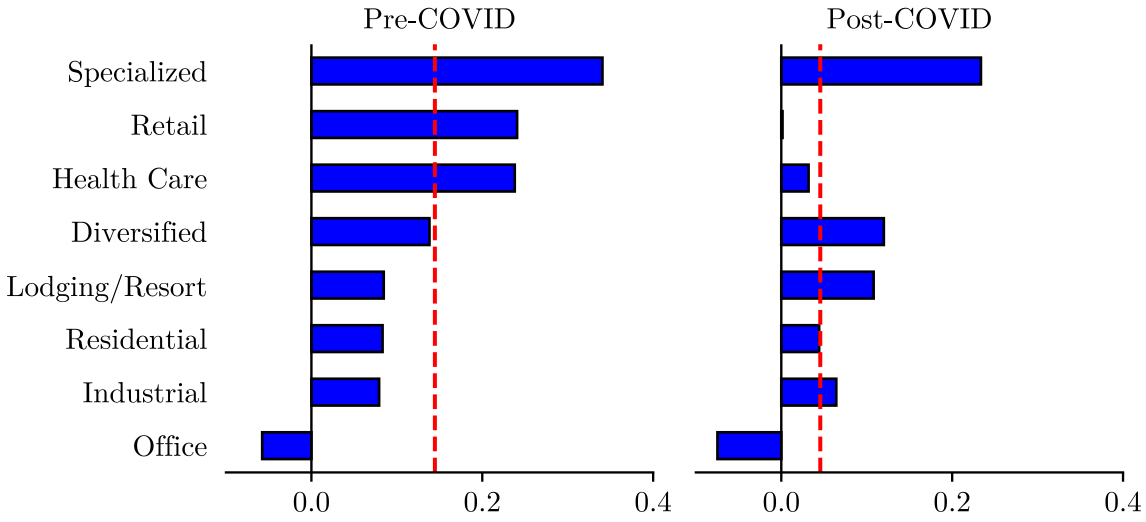
Monopolism varies within the REIT space by vertical. Figure 4 reports the median Lerner index by vertical for the whole 2012-2023 period.

Figure 4: Lerner by REIT Vertical



The story becomes more interesting, however, when we split the data into pre- and post-COVID groups. Nearly all verticals saw their monopolism decrease with the pandemic, except for Lodging and Resort REITs. Diversified, Specialized, Industrial, and Office REITs' market power did not change significantly with the pandemic. Residential REITs' power did decrease slightly, perhaps because of changing geographic preferences. Health Care and Retail monopolism dropped significantly. The story behind Retail's monopolism drop is straightforward: the pandemic impacted the way individuals shop, pushing much of the volume online. However, the drop in Health Care monopolism is not as straightforward. This vertical includes elderly care and housing facilities, which lost popularity during the pandemic. Beyond this suggestion, I do not know how Health Care's monopoly power decreased. Perhaps some medical office space is closely substitutable with office space, or maybe developers overbuilt in this vertical due to the lack of new development in Office. Interestingly, the Office vertical operated with a negative Lerner index both before and after the onset of COVID, indicating this space was already competitive and overbuilt before the pandemic.

Figure 5: Lerner by REIT Vertical, COVID Effects



Occupancy and Market Power

Investors and analysts consider occupancy a key metric when evaluating a REIT. Using data from year-end financial statements (form 10Ks), I gathered occupancy information on over one hundred firms. Interestingly, these occupancy figures are unaudited—there is no legal mandate to convey them accurately. Indeed, most firms only report occupancy for their "stabilized" portfolio, which they define as already having a high occupancy.

Table 3: Occupancy Descriptive Statistics

Mean	0.901
Std. Dev	0.095
Minimum	0.544
25th Percentile	0.869
Median	0.930
75th Percentile	0.967
Maximum	1.000

Nonetheless, these figures provided valuable insight into how market power interacts with real estate fundamentals. Occupancy and market power relate strongly, even when controlling for REIT vertical and year. A REIT with higher occupancy is likely to have more market power—in

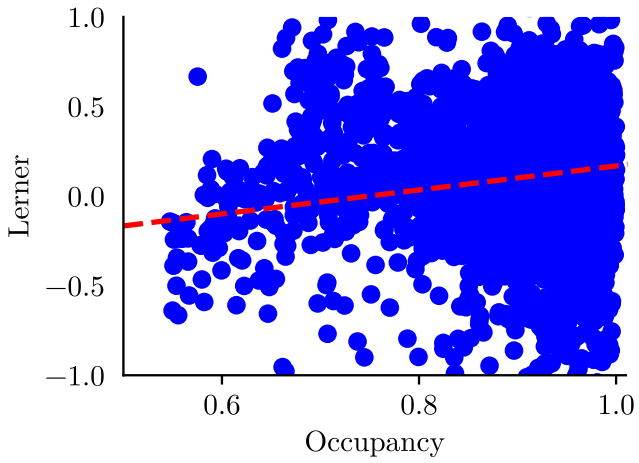
fact, increasing occupancy by ten percentage points can result in a Lerner index increase of 1.5 standard deviations, potentially bringing a REIT from one of the least monopolistic to one of the most. The median Lerner index for REITs with occupancy above 99% was 0.255. Table 4 reports the coefficients of interest for this regression, and Figure 6 offers an illustrative scattergram with a best-fit line. Though the regression leaves much unexplained, the statistical significance clearly indicates monopolism and high occupancy go hand-in-hand.

Table 4: Occupancy and Monopoly Power

$$\text{Lerner}_i = b_0 + b_1(\text{Occupancy}_i) + \Gamma_{v,t}$$

Occupancy (b_1)	0.669 ***
	(0.081)

Figure 6: Illustrative Scattergram – Lerner vs. Occupancy



Geography and Market Power

Real estate is inseparable from its geographic location, and therefore the demographic changes that occur around it. No geography receives more attention than the "Sunbelt," a loosely defined set of US states that includes the South and parts of the West. This area deserves the attention it gets—Sunbelt[1] exposure positively relates with monopoly power. I examined the 2023

[1] Alabama, Arkansas, Arizona, Colorado, Florida, Georgia, Louisiana, Mississippi, North Carolina, New Mexico, Nevada, Oklahoma, South Carolina, Tennessee, Texas, Utah

year-end portfolio[2] of over one hundred currently public REITs, finding that their current exposures to this area explain their monopoly power over the whole time period. However, when limiting this analysis to 2023, I find a negative relationship between Sunbelt exposure and power, suggesting this area now sees intense competition. Commercial real estate commentary and news reporting claim that developers overbuilt in some Sunbelt markets and are only now feeling the effects. These results might support such a view.

Table 5: Sunbelt Exposure and Monopoly Power

$$\text{Lerner}_i = b_0 + b_1(\%\ \text{Sunbelt}_i) + \Gamma_{v,t}$$

	2012-2023	Only 2023
% Sunbelt (b_1)	0.045 **	−0.188 ***
	(0.021)	(0.072)

Monopolism and Excess Returns

I close this paper by examining whether investing in monopolistic REITs yields excess risk-adjusted returns. I regress monthly alpha on the Lerner index, controlling for market capitalization, REIT vertical, and the year of the observation. First, I find that a REIT will outperform the S&P 500 on a risk-adjusted basis *while it is monopolistic*. This is not surprising: accounting profits are associated with the Lerner index, meaning a profitable firm is likely to have a higher Lerner index. Obviously, a firm that experiences unexpected profitability will outperform the market. Therefore, one should expect a positive relationship between contemporaneous outperformance and monopoly power. I find a similar result with nonfinancial corporations, but stronger.

But can monopoly power predict future returns? Perhaps it can with nonfinancial corporations, but I find no such predictive value in REITs. I regress the 5-year forward monthly alpha on the Lerner index for REITs and nonfinancials, finding that a portfolio of nonfinancials

[2] This was exceptionally difficult to compile. I do not have access to a data provider that documents each REIT's state-by-state exposure over time. Instead, I examined each firm's 10K individually for December 31, 2023 (or the nearest date). I feel comfortable applying this exposure to the firms' past observations because REITs do not change their portfolios all at once—instead, they acquire and dispose of a handful of properties each year, rarely accounting for more than 10% of their portfolio. Thus, 2023 portfolio figures reflect, *at worst*, 90% of 2022 exposures, and by extension 81% of 2021 exposures, and so on. Future studies should consider exploring past portfolio exposures explicitly (if they have a willing research assistant to do this tedious work).

with a Lerner index one standard deviation above the mean should outperform the market by 28 basis points annually. The result for REITs is statistically insignificant and much smaller. Investors should consider this information carefully—these regressions lack the rigor one will find from graduate-level portfolio theory research.

Table 6: Alpha and Monopoly Power

$$\alpha_i = b_0 + b_1(\text{Lerner}_i) + b_2(\text{Mkt. Cap}_i) + \Gamma_{v,t}$$

	Contemporaneous Alpha		Five Year Forward Alpha	
	REITs	Nonfinancials	REITs	Nonfinancials
Lerner (b_1)	0.0014 ***	0.0085 ***	0.0004	0.0045 ***
	(0.0003)	(0.0004)	(0.0004)	(0.0006)
$\Delta\alpha$ for $1\Delta\sigma$ in Lerner	0.0006	0.0004	0.0002	0.0002
Annualized $\Delta\alpha$	0.74%	0.52%	0.23%	0.28%

Conclusion

This paper explored the relationships between monopolism and numerous variables interesting to commercial real estate practitioners. There are several takeaways. REITs are more monopolistic than the average firm, but that monopolism is less persistent. REIT monopolism levels differ by REIT vertical. The Coronavirus pandemic impacted REIT monopolism in several ways. Occupancy in REIT properties is positively related to REIT monopolism, when controlling for the REIT's vertical. Sunbelt exposure had been positively related to a REIT's monopoly power, but this relationship has reversed since the beginning of 2023. Finally, monopoly power does not explain REIT stock market outperformance well, unlike in nonfinancial corporations.

This is an area in need of additional research. Few papers discuss monopolism in the real estate industry, despite its perennial economic and political relevance. The Lerner index of market power is aptly suited for this industry where other measures of power are impractical or patently invalid. With this paper, I hope to spark discussion and academic activity regarding real estate and monopoly power.

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