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NAV Ratios and REIT Takeovers: The Role of Public and Private Deal Premiums

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ABSTRACT

We investigate how net asset values (NAVs) impact equity real estate investment trusts (REITs) in the market for corporate control. REITs trading at discounts to NAV are more likely to be acquired than those trading at premiums to NAV. For each acquisition, there is a public deal premium (the deal value relative to stock price) and a private deal premium (the deal value relative to NAV). REITs trading at discounts to NAV command larger public deal premiums and smaller private deal premiums. Shareholders of targets respond more favorably if the REIT is trading at a discount to NAV. Three-day cumulative abnormal returns (CARs) around acquisition announcements are 11% higher for targeted REITs that are trading below a price-to-NAV ratio of 0.95 than those trading at a price-to-NAV ratio above 1.05. The sale of a REIT trading at a discount to NAV appears to be a productive transaction for both acquirers and targets.

KEYWORDS

REITs; NAV; valuation; mergers and acquisitions; parallel markets

Introduction

Property portfolios of equity real estate investment trusts (REITs) are unique in that they trade on two distinct markets: the public stock market and the private commercial real estate market. Analysts routinely estimate the net asset value (NAV) of the REITs' property portfolio on the private market. Whether these estimated NAVs and their deviations from stock prices represent mispricing (and associated arbitrage opportunities) or are simply a function of slow-moving private market valuations is subject to debate. However, some recent empirical evidence suggests these price-to-NAV ratios are meaningful measures of relative valuation to managers and shareholders.

Managers appear to monitor the price-to-NAV ratio to inform optimal corporate decisionmaking. Soyeh et al. (2021) investigate how management equity issuance decisions are impacted by NAV. Similarly, Boudry et al. (2010) examine how REIT financing choices are related to the level of relative valuation. Specifically, they find that REITs are more likely to issue equity when they are trading at a premium to NAV. Kim and Wiley (2019) document that a REITs premium or discount to NAV impacts REIT acquisition and disposition activity. REIT net investment is positively related to price-to-NAV ratios. Shareholders also incorporate the price-to-NAV ratio in their investment decisionmaking. Chacon et al. (2021) find analyst estimates of NAV convey unique information to the

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stock market. Downs et al. (2019) show that activist investors are more likely to target REITs trading at discounts to NAV.

In contrast, a mature literature documents that price discovery occurs in the public markets and private markets incorporate information with a lag (Ling & Naranjo, 2015; Oikarinen et al., 2011; Yavas & Yildirim, 2011; Yunus et al., 2012). For example, Yavas and Yildirim (2011) examine the dynamic relation between NAV estimates and prices and find that NAV estimates tend to trail price movements. These literatures conflict with one another regarding whether private market information (NAVs) is useful or simply lagging public market information content. We contribute to this line of research by examining the role of NAV estimates in a key area of corporate and investor decisionmaking: the market for corporate control.

Practitioners seem to believe that REITs trading at discounts to NAV make attractive takeover targets. For example, Cohen & Steers (2018) makes the following statement:

> The existence of opportunities for investors to acquire public REITs at parity to NAV or less is what is fueling the continued takeover activity by both public and private investors.
>
> —Cohen and Steers, Inc., November 2018

A merger or acquisition (M&A) transaction will always occur at a deal value above the stock price of the target. Therefore, opportunities to acquire a REIT at or near the NAV will only occur when the REIT's stock price is below the NAV. When REITs are trading at premiums to NAV, the deal value will necessarily be well above the NAV because the current stock price is greater than the NAV and the deal value will be greater than the stock price.

Anecdotal evidence suggests REIT shareholders may also view the sale or merger of the REIT as a successful exit option when trading at a discount to NAV. An activism case highlighted in Downs et al. (2019) illustrates this view. In 2015 a well-known REIT activist, Land & Buildings Investment Management LLC (L&B), took a large ownership stake in the residential REIT American Residential Properties, Inc. (ARPI). L&B specifically noted share price underperformance relative to the NAV as a reason for the intervention. Ultimately, ARPI merged with American Homes 4 Rent (AMH) in a public-to-public transaction.[1] CIO Jonathan Litt made the following comment expressing support for the merger:

> We are pleased the Board of American Residential Properties has chosen to move forward with a transaction, a path which we believe represents a positive outcome for all shareholders. As we have publicly stated, ARPI has traded below its intrinsic value for some time and it was clear that a new path was needed to unlock the value imbedded in the Company.
>
> —Jonathan Litt, Founder and Chief Investment Officer (L&B; Business Wire, 2015)

If REITs trading at discounts to NAV are attractive targets to potential acquirers and their sale is a sufficient exit option for current shareholders, it follows that the price-to-NAV ratio should impact the likelihood of being acquired. Acquirers could purchase the REIT at near or below the NAV and shareholders can liquidate their underperforming investment without taking a significant loss relative to the underlying value of the assets. However, there are a few reasons to suspect this may not be the case.

First, the broad publication of REIT NAVs by sell-side analysts implies that all parties, including the REITs shareholders, management, the board who approves the sale, and

potential acquirers, are privy to the level of price discrepancy between the two markets. Therefore, selling parties may be reluctant to sell at a discount to the NAV, even when the current stock price is significantly depressed. If REITs are unwilling to sell at discounts to the NAV, buyers may be unable to make a profitable acquisition. The existence of a publicly available NAV as a reference point may deter potential acquirers all together.

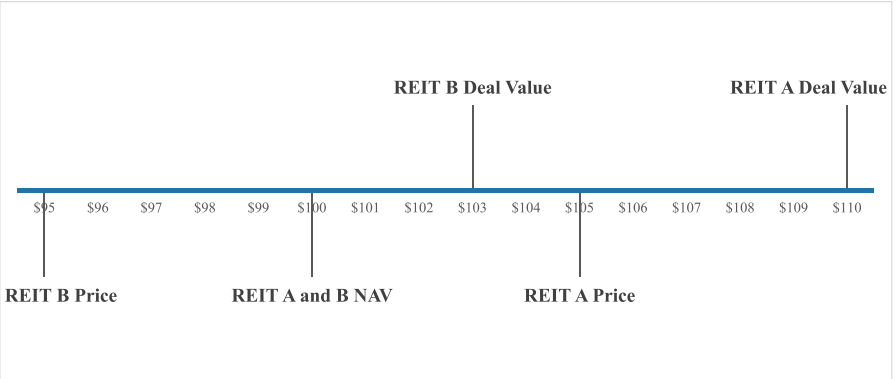
Second, the existence of an active parallel market from which the NAV is derived provides REIT management with a potentially superior alternative to an outright sale of the entire REIT. Unlike most industrial corporations that cannot easily sell their assets piecemeal at a profitable price, REITs do have this flexibility, albeit with some limitations. The ability of the REIT to dispose of properties near the estimated NAV value should place upward pressure on the price at which potential acquirers would be able to purchase the REIT. This upward pressure could make the acquisition less attractive to potential bidders, decreasing the likelihood of the REIT being targeted.

Interestingly, Kim and Wiley (2019) decompose asset acquisition and disposition activity and find that REITs are no more likely to dispose of assets when trading at a discount to NAV. They argue that REITs' inability to dispose of some assets without significant tax consequences (Mühlhofer, 2013) and managements' financial incentive to be larger (Graff, 2001) limit this channel. Specifically, Graff (2001) argues that CEO compensation is related to firm size; therefore, management may be disincentivized to shrink the firm. Given all these factors, whether the price-to-NAV ratio is a determinant of REIT M&A activity is an open empirical question we aim to address.

We investigate the acquisition of 79 equity REITs with available NAV data between 2001 and 2017 and test whether the price-to-NAV ratio is a significant determinant of takeover likelihood. We construct a matched sample and find that REITs that are acquired have significantly lower price-to-NAV ratios than the matched sample of REITs that are not acquired. Because price-to-NAVs tend to move together for the entire REIT market and within property sectors, we also examine price-to-NAV relative to the average price-to-NAV of the market and property sector. In all cases, we find that price-to-NAV ratios are between 4.2% and 8.6% lower for targeted REITs than for their nontargeted counterparts. This evidence suggests that price-to-NAV ratios are a significant determinant of takeover likelihood.

If the price-to-NAV ratio is a determinant of takeover likelihood, it is natural to question how it impacts other aspects of the transaction. Arguably, the most important component of an M&A negotiation is the price the acquirer pays for the target. This price, known as the deal value, is typically evaluated relative the stock price of the target to determine the deal premium.[2] Due to the unique existence of parallel asset markets for their properties, REIT acquisitions face two distinct deal premiums: a public deal premium and a private deal premium. The public deal premium is the deal value relative to the REIT's stock price and the private deal premium is the deal value relative to the estimated NAV.

The concept of public and private deal premiums is novel to the literature. Figure 1 illustrates these premiums for two hypothetical REITs. REIT A and REIT B both have an analyst estimated NAV of $100. However, REIT A is trading a premium to NAV with a stock price of $105 and REIT B is trading at a discount with a stock price of $95. The price-to-NAV ratio of REIT A and REIT B is therefore 1.05 and 0.95, respectively. Both REITs are then acquired at a deal value greater than their current stock price. REIT A is acquired at a deal value of



REIT	Price to NAV	Public Deal Premium	Private Deal Premium
REIT A	**1.05**	**1.05**	**1.10**
REIT B	0.95	1.08	1.03

Figure 1. This figure provides a visual to conceptualize private and public deal premiums. Both REIT A and REIT B have net asset value (NAV) estimates of $100. REIT A is trading at a premium and REIT B is trading at a discount to their respective $100 NAVs. The deal values relative to their current stock price determine the public deal premium and the deal value relative to their current NAV determines the private deal premium.

$110 and REIT B at $103. The public deal premiums are calculated as the deal value divided by the stock price. The REIT A public deal premium is 1.05 ($110/105 rounded to neared tenth) and the REIT B public deal premium is 1.08 ($103/95). The private deal premiums are calculated as the deal value divided by the NAV. For REIT A and REIT B, the private deal premiums are 1.10 (110/100) and 1.03 (103/100), respectively.

We next examine how the price-to-NAV ratio impacts public and private deal premiums and propose three hypotheses. Given all parties are privy to the estimate of value of the REIT's assets, we hypothesize that the negotiated deal value will anchor toward the NAV value. If the estimated NAV is a reasonable measure for what the REIT could command for the property portfolio on the private market, then private market competition should place upward pressure on the deal value of REITs trading at discounts to NAV and place downward pressure on the deal value of REITs trading at premiums to NAV. This implies a negative relation between price-to-NAV ratios and public deal premiums. REITs trading at discounts to NAV will command higher public deal premiums and REITs trading at premiums to NAV will command lower public deal premiums.

If acquirers have to pay greater public deal premiums for REITs trading at lower price-to-NAV ratios, why do they continue to target them? While they pay larger premiums over the stock price (public deal premiums), they would pay lower premiums, or even discounts, to the NAV (private deal premiums). If acquirers incorporate the private market value of the REIT in their target selection process, REITs trading at discounts to NAV should make for more attractive targets. We label this the *NAV Anchoring* hypothesis.

This hypothesis may not hold true due to the lack of bargaining power of REITs trading at steep discounts to NAV. REITs trading at such discounts may not be able to negotiate attractive deal premiums for their shareholders. These REITs are more likely to be targeted by activists (Downs et al., 2019) and may have disgruntled shareholders seeking to change

the management team. In contrast, REITs trading at premiums may be in a comfortable position to negotiate greater deal premiums. Their superior negotiating leverage may allow them to only select attractive deals. This hypothesis is particularly attractive if NAV premiums capture REIT quality. One could reasonably expect that given two REITs are being acquired, the one with the higher valuation could command a more attractive deal. We refer to this as the *Bargaining Power* hypothesis. Under this hypothesis, we would also observe a positive relation between price-to-NAV ratios and private deal premiums as REITs trading at premiums to NAV would have even higher deal values relative to the underlying NAV.

Finally, if the NAV is simply an analyst-estimated measure based on information that lags stock prices, it should not impact deal values at all. As noted previously, the price discovery literature would suggest that private market information should not provide incremental information regarding REITs. Rather, it is only the price that contains innovative information, and the private market (NAV) incorporates this information with a lag. We refer to this null hypothesis as the *NAV Irrelevance* hypothesis. Under this hypothesis, the relation between price-to-NAV and both public and private deal premiums would be indistinguishable from zero. Given the three hypotheses, we turn to the data to see which hypothesis is supported empirically.

We document consistent evidence in support of the *NAV Anchoring* hypothesis. The price-to-NAV ratio is negatively related to public deal premiums. The average public deal premium for REITs acquired with a price-to-NAV ratio below 0.95 is 1.19 (19%) and the average deal premium for REITs acquired with a price-to-NAV ratio greater than 1.05 is 1.11 (11%). In multivariate analysis, we find that the coefficient of each measure of price-to-NAV ratio (firm, market-adjusted, and sector-adjusted) is negative and statistically significant in a regression on deal premiums with a robust set of control variables and fixed effects.

Consistent with the *NAV Anchoring* hypotheses, we also document a strong positive relation between the price-to-NAV ratio and the private deal premium. The average private deal premium for REITs trading at a price-to-NAV below 0.95 is 0.97. This implies that the average deal for these REITs occurs 3% *below* their estimated private market value. For REITs trading at a price-to-NAV greater than 1.05, the average private deal premium is 1.29, suggesting acquirers pay 29% above the estimated private market value. Taken together, these findings suggest that attractive private deal premiums are an important factor as to why REITs trading at discounts are more likely to be targeted.

Finally, we examine how price-to-NAV ratios impact the target REIT shareholder reaction to deal announcements. Given shareholders own the REIT in the public market, the public deal premium directly impacts their return should the deal go through. If REITs trading at discounts to NAV are able to garner greater public deal premiums, we expect they will also command greater target shareholder responses to the deal announcements. Consistent with this intuition, we document a significantly greater target [−1,+1] trading day CAR response for REITs trading at discounts to NAV than those trading at premiums. Specifically, REITs acquired with a price-to-NAV ratio below 0.95 have an average CAR of 17% and those with a price-to-NAV ratio greater than 1.05 have an average CAR of 6%. Multivariate analysis confirms this finding after controlling for key variables identified in the previous M&A literature.

Our work contributes to three strands of the literature. First, a burgeoning literature examines the role of parallel asset markets for equity REIT corporate decisions. Tension

exists in the literature regarding whether analyst-estimated NAVs are meaningful. Some of the work focuses on how management responds to their firms' premium or discount to NAV (Boudry et al., 2010; Wiley and Kim, 2019). Other work focuses on how equity investors and activists respond to NAV (Chacon et al., 2021; Downs et al., 2019). However, other authors such as Yavas and Yildirim (2011) document that analyst-estimated NAVs trail public market prices, suggesting they are simply lagging price discovery in the public markets. To our knowledge, our work is the first to examine how the parallel asset markets impact the market for corporate control.

Second, our work builds on a relatively mature literature of M&A in the REIT industry. Our article is specifically focused on drivers of takeover likelihood and wealth effects for targets. While several articles document various drivers of takeover likelihood for equity REITs (Eichholtz & Kok, 2008; Hardin & Wu, 2009; Ling & Petrova, 2011), we are the first to our knowledge to investigate the price-to-NAV ratio and the associated public and private deal premiums. Relative valuation is distinct from other measures known to impact takeover likelihood such as historical performance as relative valuation captures how the firm is priced in the two markets, not how the firm has performed. We provide evidence that the relative valuation differences create attractive deal possibilities for acquirers and targets alike. Additionally, given NAVs are analyst estimates, we provide evidence that sell-side analysts impact the market for corporate control for REITs.

Finally, we contribute to the broader M&A finance literature. A subset of the literature examines target valuation with mixed findings regarding its relevance (Ambrose & Megginson, 1992; Bates et al., 2008; Cremers et al., 2009; Dong et al., 2006; Edmans et al., 2012; Palepu, 1986). Given target valuation relative to the stock price is notoriously difficult to calculate for industrial firms, we provide an interesting laboratory where an estimate of the target's value is more readily apparent. Several of these articles utilize Tobins Q or the market-to-book ratio to measure target valuation. As noted in Capozza and Seguin (2003), REIT price-to-NAV ratios can be thought of as a superior measure of Tobins Q that is unavailable to industrial firms.

The remainder of the article is organized as follows. First, we review the relevant literature. Then, we develop the testable hypotheses. After that, we describe the data and empirical methods, respectively. We then discuss the findings and conclude the article.

Literature Review

There exists a relatively large literature on REIT M&A activity (see Glascock et al., 2018 for a comprehensive review of the literature). Our article is specifically related to the literature on the drivers of takeover likelihood and the sources of target announcement returns. Regarding drivers of takeover likelihood, Eichholtz and Kok (2008) use an international sample of real estate firms and show that poor operating and stock price performance leads to an increased likelihood of being targeted. They argue that the market for corporate control is active in the real estate market and inefficient managers are targeted. Hardin and Wu (2009) focus on the access to finance channels. They show that REITs that lose their primary banking relationship are more likely to be acquired.

Ling and Petrova (2011) provide a broader investigation of the characteristics of REITs that become takeover targets. They find that REITs are more likely to be targeted if they

are smaller, are not umbrella partnership real estate investment trust (UPREIT), have lower liquidity, have higher dividend yields, and have higher institutional ownership. The focus of their article is on the differences between public-to-public acquisitions and public-to-private acquisitions. Specifically, they find that targets of private bidders have lower leverage and lower profitability ratios than targets of public bidders. They also examine target announcement returns and document that public-to-private deals lead to greater abnormal returns. We are unaware of any real estate literature that examines the impact of target valuation on takeover likelihood. We fill this gap in the literature, but utilizing the unique feature of parallel asset markets to proxy for target valuation in REITs.

Other recent work in the REIT M&A space examine various non-balance sheet facets of REITs that impact the market for corporate control. For example, Freybote and Qian (2015) focus on asset location, Lu et al. (2015) focus on managerial incentives, and Daniels and Phillips (2007) examine the role of financial advisors. These various studies provide a rich understanding of the REIT M&A market.

Many articles quantify abnormal returns to targets at the announcement date of the acquisition.[3] A key finding in the real estate literature is that abnormal returns around announcement dates for REITs are significantly lower than for industrial firms. Various arguments are put forth as to why this is the case, each relating to the nature of the real estate industry. For example, Campbell (2002) and Eichholtz and Kok (2008) argue that the homogeneity of assets decreases potential synergy gains. Womack (2012) argues it may be driven by predicable future cash flows, long-term leases, and other features of real estate assets. Rather than focusing on comparing target announcement returns in the REIT industry to general corporations, our article focuses on how target announcement returns are impacted by NAV estimates.

The unique feature of parallel asset markets for REITs has been explored in various contexts in the real estate literature. Much literature has focused on identifying the source of the discount (or premium) to NAV (Anderson et al., 2005; Barkham & Ward, 1999; Brounen et al., 2013; Capozza & Korean, 1995; Clayton & MacKinnon, 2001; Letdin et al., 2022). Variables such as short sale constraints, volatility, firm size, insider ownership, tax structure, agency costs, leverage, sentiment, and risk have been linked to the discrepancy between stock prices and NAVs. More recent literature investigates NAVs as analyst estimates. For example, Chacon et al. (2021) show that analyst estimates of NAV contain significant incremental information for investors. Letdin et al. (2018) show that NAV analyst coverage has a positive impact on REIT value and a negative impact on REIT volatility. Letdin et al. (2022) focus on divergence of opinion of analyst NAV estimates and the impact on stock performance.

Our article closely relates to a burgeoning literature that examines how discounts or premiums to NAV impact REIT manager and shareholder decisionmaking. Boudry et al. (2010) show that REITs are more likely to issue equity when they are overvalued, as measured by their premium to NAV. Downs et al. (2019) find that REITs trading at discounts to NAV are more likely to be targeted by shareholder activists. Ling et al. (2019) examine the asset growth anomaly and find that REITs with higher growth rates tend to underperform REITs with lower growth rates. Interestingly, they document that this result is mitigated when the fast-growing REITs are trading premiums to NAV, suggesting asset growth is potentially valuable when the REIT has a cost of capital advantage in the

public market. Kim and Wiley (2019) examine how the premium (discount) to NAV impacts REIT transaction activity in the property market. They document an increase in net real estate investment when REITs are trading at premiums to NAV. However, when they decompose net real estate investment into acquisitions and dispositions, they find the result is driven by increased acquisition activity when the REIT is overvalued relative to the commercial property market. That is, when REITs are undervalued, they do not find evidence that REITs are more likely to sell assets. They argue that this finding may be driven by regulations REITs face when disposing of assets. As noted in Mühlhofer (2013), REITs are subject to the dealer rule, which subjects them to minimum holding periods for properties.

A mature literature exists in the mainstream finance literature examining M&A. A key strand of literature pertaining to our work focuses the relation between firm valuation and takeover likelihood. The findings of this literature to date are generally mixed. Specifically, Cremers et al. (2009), Bates et al. (2008), Palepu (1986), and Ambrose and Megginson (1992) document no relation between measures of valuation and target likelihood, Edmans et al. (2012) and Dong et al. (2006) document a negative relation, and Rhodes-Kropf et al. (2005) document a positive relation.

Finally, Baker et al. (2012) document the role of anchoring in the M&A negotiations process. Specifically, they show that deal values are biased toward recent peaks in target stock prices (e.g., the 52-week high). They argue that parties use these somewhat arbitrary price peaks as anchors to simplify the merger valuation process. In our context, the reference point is the NAV and, although it is far from arbitrary, it can very well serve as an anchor that drives up deal values when the REIT is trading at a discount to NAV.

Hypothesis Development

In this article, we investigate how the existence of parallel markets for REIT properties impact the market for corporate control. Specifically, we focus on the case where the REIT is a takeover target. We first question how the existence of an active market for the REIT's properties impacts the likelihood of the REIT to be a takeover target. Analysts routinely estimate the NAV of the REIT using market comparables from recent property transactions in the private market. This NAV provides a benchmark for the intrinsic value of the REIT's assets that is meant to be compared to the current stock price of the REIT.

In a world with no frictions and accurate public and private market valuations, if a REIT were trading a significant discount to its NAV, the market for corporate control would activate and potential buyers would make a profitable acquisition. The buyers would seek to buy at a premium to the current stock price and a discount to the NAV. The acquirer would capture the difference between the purchase price and the NAV and the sellers would earn a premium on the current public market value of their shares.

However, there are three reasons to suspect this may not be the case. First, while the REIT and prospective buyers conduct their own NAV analysis, sell-side analysts estimated NAVs are publicly available information. Therefore, all parties involved in the transaction are privy to the estimated value of the REIT's properties on the private market. This publicly available knowledge could limit the acquirer from being able to purchase the REIT at an attractive price relative to the intrinsic value. Second, unlike most industrial firms,

REITs have the option to sell their properties individually on the private commercial real estate market. They may be able to transact at or near the estimated NAV, given the NAV is estimated based on this market. If they can sell properties at the NAV, why would they pursue a sale of the entire REIT at a share price below the NAV?

Finally, a mature literature questions whether private market information is useful to public market participants at all (Ling & Naranjo, 2015; Oikarinen et al., 2011; Yavas & Yildirim, 2011; Yunus et al., 2012). For example, Ling and Naranjo (2015) document that equity REIT returns incorporate information more quickly than private market returns because of their greater liquidity and price revelation. Given NAV estimates are based on private market valuations (prevailing capitalization rates and net operating income (NOI) forecasts), if they contain no relevant information, the price-to-NAV ratio should have no impact on the likelihood of a REIT being acquired.

While these factors may be at play, it is plausible that REITs trading at discounts to NAV still represent attractive M&A opportunities for both acquirers and target shareholders. First, consider the private deal premium an acquirer would receive if they purchased a REIT trading at a premium to NAV compared to a REIT trading at a discount to NAV. Assume REIT A and REIT B both had the same stock price of $100 and were acquired for $112/share (1.12 public deal premium). REIT A was trading at a price-to-NAV of 1.10 (premium) and REIT B was trading a price-to-NAV of 0.90 (discount). While the public deal premium is identical for each, the private deal premiums for each transaction would be 1.23 and 1.01 for REIT A and REIT B, respectively.[4] If, as anecdotal evidence suggests, acquirers incorporate the NAV in their analysis and are therefore concerned with private deal premiums, they should be more likely to target REITs trading a discount to NAV.

Additionally, while REITs may have the option to sell their properties piecemeal in the private market, they face some limitations in doing so. REITs were initially created by Congress to be passive vehicles; therefore, they are limited from significant property portfolio turnover. Wiley and Kim (2019) examine property disposition activity and price-to-NAV ratios and do not find a significant relation. They note that this may be because REITs are subject to the dealer rule (Mühlhofer, 2013) and management generates more compensation from being larger (Graff, 2001). Therefore, REITs may be reluctant or unable or unwilling to dispose of properties with such ease. Finally, burgeoning literature provides supportive evidence that NAV ratios are useful to manager decisionmaking. For example, Boudry et al. (2010) document that NAV ratios impact equity issuance decisionmaking. Given these arguments, whether REIT discounts to NAV are related to takeover likelihood is ultimately an empirical question. We therefore investigate the following null hypothesis:

H1: There is no relation between the price-to-NAV ratio and the likelihood of being a takeover target.

Next, we investigate how the parallel markets for REITs assets impacts public and private deal premiums of REIT M&A. The deal value is the price negotiated by the acquirer and target that is sufficient to entice equity holders of the target to sell and equity holders of the acquirer to buy. How is this price negotiated and how would the parallel market for REIT's assets impact these negotiations?

We propose several testable hypotheses. First, we hypothesize there exists a negative relation between price-to-NAV ratios and public deal premiums and a positive relation

between price-to-NAV ratios and private deal premiums. If REITs can sell their individual properties in the private market at or near the estimated NAV, potential acquirers in the public market are forced to compete with the private market participants for the REIT's assets. This should lead to acquisition prices closer to the NAV. Therefore, larger public deal premiums would accrue to REITs trading at greater discounts to NAV.

This relation should also hold when the REIT is trading at a premium to NAV. However, no REIT would sell at a discount to the current stock price, regardless of how low the NAV is relative to the stock price. Therefore, the deal value will always be above NAV in the case of a REIT trading at a premium to NAV. Competition in the private market for the REIT's assets would be moderated given the high relative public market valuation. This would place downward pressure on the negotiated deal value, resulting in a lower public deal premium for REITs trading at high price-to-NAV ratios. In summary, the deal price would anchor toward the NAV for REITs trading at both a premium and discount to NAV.

If this is the case, we expect REITs with low price-to-NAV ratios to command lower private deal premiums than those with high price-to-NAV ratios. The ability to purchase a REIT at or near the NAV is precisely what makes low price-to-NAV REITs attractive takeover targets for potential acquirers. REIT shareholders agree to the sale because they can exit at an attractive public deal premium and acquirers purchase the assets at an attractive private deal premium. Given REITs cannot be purchased for less than the stock price, the private deal premium will be larger for REITs trading at higher price-to-NAV ratios. We refer to this hypothesis as the NAV Anchoring hypothesis.

Alternatively, REITs trading at steep discounts to NAV are generally perceived to be underperforming firms. Downs et al. (2019) shows that these firms are more likely to be targeted by activist investors pushing for change. REITs trading at premiums to NAV are generally perceived to be healthy firms. It is possible that REITs trading at discounts to NAV may have less bargaining power in M&A negotiations than those trading at premiums to NAV. In that case, given two REITs are being acquired, REITs trading at low price-to-NAV ratios may be cornered into suboptimal public deal premiums whereas those trading at high price-to-NAV ratios can negotiate attractive deals. This hypothesis would predict a positive relation between the price-to-NAV ratio and public deal premiums. For private deal premiums, this would also suggest a positive relation with price-to-NAV. We refer to this hypothesis as the Bargaining Power hypothesis.

These hypotheses are tested against a null hypothesis that the NAV ratio is simply not relevant to the dealmaking process. If NAV ratios, estimated by analysts, do not contain value relevant information, we expect there to be no relation between price-to-NAV ratios and public or private deal premiums. As noted previously, the price discovery literature suggests this to be the case. We refer to this as the NAV Irrelevance hypothesis.

Appendix B presents hypothetical deals to demonstrate each of these hypotheses. For each of the three alternative hypotheses, there is a representative M&A deal for a REIT trading at a premium to NAV (Price-to-NAV $>$ 1) and a discount to NAV (Price-to-NAV $<$ 1). For each deal, there is a hypothetical preannouncement stock price, a NAV ratio, and a deal value. From these three variables, we calculate the price-to-NAV ratio, the public deal premium (Deal value-to-Price) and the private deal premium (Deal value-to-NAV). Finally, based on the hypothetical deals for the REITs trading at premiums and discounts

to NAV, one can interpret whether the relation between the price-to-NAV ratio and the public and private deal premiums are positive or negative.

For all examples, the NAV is $100 per share and the price is $105 for the REIT trading at a premium to NAV and $95 for the REIT trading at a NAV discount to NAV. All the deals are constrained by the reality that the deal value must occur at a price higher than the current stock price, but it need not be greater than the NAV. Each example differs based on the deal value per share. Columns 1 and 2 present the predictions based on the NAV Anchoring hypothesis. In this example, because the deal value anchors toward the NAV, the public deal premium is compressed for the REIT trading at a premium to NAV (1.05) and expanded for the REIT trading at a discount to NAV (1.08). This leads to a negative relation between price-to-NAV ratios and public deal premiums. If buyers are interested in REITs trading at discounts to NAV because they can purchase them closer to the NAV, what follows is a positive relation between price-to-NAV ratios and private deal premiums. Indeed, in the hypothetical example, the REIT with the higher price-to-NAV ratio also has a higher private deal premium (1.10 compared to 1.03).

Columns 3 and 4 present hypothetical deals under the Bargaining Power hypothesis. If REITs trading at premiums to NAV have greater bargaining power, they will command higher public deal premiums than similar REITs trading at discounts to NAV. In this hypothetical example, we observe a positive relation between price-to-NAV ratios and public deal premiums. The REIT trading at a premium to NAV garners a public deal premium of 1.10 compared to 1.04 for the REIT trading at a discount to NAV. Similar to the NAV Anchoring hypothesis, there would exist a positive relation between price-to-NAV ratios and private deal premiums.[5]

Finally, Columns 5 and 6 present hypothetical deals under the NAV Irrelevance hypothesis. Under this hypothesis, there is no prediction regarding the relation between price-to-NAV ratios and public or private deal premiums because the underlying NAV is not relevant to the dealmaking practice. To demonstrate this hypothesis completely, we would require several deals that demonstrate both positive and negative relations and average out to zero. However, for simplicity, in the example, we include a case where the relation between the price-to-NAV ratio and the public deal premium is negative and the relation between price-to-NAV and private deal premiums is also negative. Specifically, the REIT trading at a premium to NAV is acquired at a lower public deal premium than the REIT trading at a discount to NAV (1.05 compared to 1.21). Additionally, the REIT trading at a premium to NAV has a lower private deal premium than the REIT trading at a discount to NAV (1.10 compared to 1.15). We include this specific case for two reasons. First, because it is different from the other two hypotheses. Second, to assuage the concern that the relation between price-to-NAV ratios and private deal premiums is mechanical and must be positive because deal values occur at higher values than prices. In fact, it is possible to have no relation or a negative relation.

The relation between price-to-NAV ratios and deal premiums is therefore an empirical question for which we state the following null hypotheses.

H2a: There is no relation between price-to-NAV ratios and public deal premiums.

H2b: There is no relation between price-to-NAV ratios and private deal premiums.

Finally, we examine the relation between the price-to-NAV ratio and target shareholder wealth effects. Equity holders in the target REIT are predominantly concerned with the public deal premium as it represents their return on investment. If acquisitions of REITs trading at low price-to-NAV ratios are transacted at relatively high public deal premiums, equity investors in the target REIT are likely to respond more favorably to the announcement of the acquisition. If the deal value occurs near the NAV, this would represent a successful exit for shareholders who were able to liquidate underperforming investments without having to sell at the depressed public market valuation. Similarly, if REITs trading at high price-to-NAV ratios are sold at relatively low deal premiums (NAV Anchoring hypothesis), we expect the shareholder reaction to be smaller.[6] If, however, the Bargaining Power hypothesis holds true, REITs trading at lower price-to-NAV ratios would command lower premiums. In this case, we expect the target shareholder response to suffer as well. Therefore, our final hypothesis is stated in the null form as follows:

H3: There is no relation between the price-to-NAV ratio and target wealth effects.

Data

We collect data on M&As involving a U.S. equity REIT target from 2001 to 2017 from S&P Global (formerly SNL Financial). Our initial sample includes 118 observations. Then, we exclude partial acquisitions and retain only acquisitions where the bidder acquires 100% of the ownership of the target. Moreover, we require our observations to have additional accounting variables available on Compustat, and market related data on CRSP. All accounting variables are measured as of the fiscal year before the announcement of the deal. The sample is finally screened on whether analyst-estimated NAV data is available. These screens produce a final sample of 79 REIT mergers and acquisitions, including both public-to-private and public-to-public deals.[7] The primary constraint on the sample is the availability of NAV data. To have NAV data, the REIT must be covered by securities analysts that routinely estimate NAV and be collected by S&P Global. To be as thorough as possible, we next search for deals in Securities Data Company (SDC) database. We use screens identical to those utilized in Mulherin and Womack (2015). This process did not result in any additional acquisitions. We list the 79 M&A deals included in our sample in Appendix C. We collect the same data for all equity REITs in the S&P Global universe that did not receive an M&A bid in order to create our matched sample of REITs that were not targeted.

The key variable in the study is the consensus analyst estimated NAV ratio. Analysts routinely estimate and publish NAV ratios in the REIT industry. This ratio is unlike NAV ratios observed in the mutual fund industry because the mutual fund NAV is based on the public market value of the underlying portfolio. For REIT NAVs, these are analyst estimates and require a forecast of NOI and an estimate of capitalization rates (cap rate) for the portfolio. As such, the analyst estimate is imprecise by definition and subject to error. Whether these expert analyst estimates are useful in an M&A transaction is something we aim to investigate in this study. Some REIT managements publish their own estimate of NAV. Additionally, S&P Global also reports NAV estimates based on an assumed static

cap rate (e.g., NAV @5% or NAV @6%). We chose, following the literature, to use the consensus analyst estimated NAV. Estimates where the researcher selects an arbitrary cap rate would not seem useful and the REIT-estimated NAVs are subject to bias and not widely available.

Descriptive statistics are reported in Panel A of Table 1. The average target in our sample has been operating for less than 10 years, has over $2 billion in assets, with an funds from operations (FFO) to assets of 4%, and a leverage ratio of 0.54. Most targets are UPREITs and roughly 57% are acquired by a public firm. Target shareholders react positively to takeover announcements as the average target experiences a 12% cumulative abnormal return (CAR) around the announcement of the deal. This value is somewhat higher than other papers in the M&A REIT literature and is potentially due to a different sample period and subset of REITs.

Panel A also reports the values of our three price-to-NAV ratios of interest. Each price-to-NAV ratio is calculated as of 28 trading days prior to the deal announcement. This is done to avoid the run-up period that has been well documented in the M&A literature. A noteworthy observation is that the average target REIT price-to-NAV ratio is 0.96. A price-to-NAV ratio below 1 indicates the target is trading at a discount to its NAV. Our other two measures of interest are *firm/sector price-to-NAV* and *firm/market price-to-NAV*. Firm-sector price-to-NAV is defined as the difference between the firm's own price-to-NAV ratio and the average price-to-NAV ratio of REITs within the same property sector during the same time period. Firm-market price-to-NAV is defined as the difference

Table 1. Target characteristics.

Panel A: Target characteristics

	N	Mean	Std. Dev.	25th	Median	75th
Public Acquirer	79	0.57	0.50	0	1	1
UPREIT	79	0.89	0.32	1	1	1
Total Assets (millions)	79	$2,341	$3,065	$879	$1,573	$2,957
Firm Age	79	9.48	5.47	6	10	12
Leverage	79	0.54	0.15	0.49	0.54	0.59
FFO to AT	79	0.04	0.03	0.03	0.05	0.06
Dividend Yield	79	0.06	0.03	0.04	0.06	0.07
Price-to-NAV	79	0.96	0.17	0.87	0.96	1.07
Firm/Sector Price-to-NAV	79	−0.03	0.12	−0.11	−0.05	0.05
Firm/Market Price-to-NAV	79	−0.09	0.19	−0.16	−0.06	0.03
Target CAR	79	0.12	0.26	0.02	0.08	0.15

Panel B: Target REITs sector breakdown

Sector	Frequency	%
Diversified	4	5.06
Healthcare	3	3.80
Hotel	9	11.39
Industrial	4	5.06
Multifamily	12	15.19
Office	20	25.32
Other	10	12.66
Retail	17	21.52
Total	79	100

Note: Table 1 presents firm characteristics for REITs that are targeted in an M&A transaction between 2001 and 2017. Our sample includes REITs with nonmissing data for the characteristics listed. The definition of each variable is found in Appendix A. Panel A presents target characteristics and Panel B presents the primary property sector breakdown of targets.

between the firm's own price-to-NAV ratio and the average price-to-NAV ratio of all REITs during the same time period. Both measures are negative (−0.03 and −0.09 for sector and market, respectively), which further reinforce that targeted REITs are trading at a relative discount.

Panel B of Table 1 breaks down our sample by sector. Transactions occurred across all major property sectors with office REITs being the most frequent targets (25.32%), followed by retail REITs (21.52%) and multifamily REITs (15.19%). The distribution of deals across sector is generally consistent with the size of each property sector.

Table 2 reports various characteristics of the transaction. The mean acquisition was for a deal value of $1.98 billion. Notably, the average private deal premium (Deal value/NAV) is 1.10, suggesting the typical deal was purchased at a 10% premium to the analyst-estimated NAV. The mean public deal premium is 15%. A greater average public deal premium than private deal premium suggests the average REIT was purchased when trading at a discount to NAV. The majority of deals were all cash, reflecting that some public-to-public deals are all cash, and all public-to-private deals are 100% cash.

Empirical Methods

To test our first hypothesis, we investigate the relation between price-to-NAV ratios the likelihood of being acquired. We begin by collecting data on all other equity REITs in the S&P Global universe. We first examine the difference of means between acquired and all other REITs. Next, to control for the possibility that acquired REITs are materially different from nonacquired REITs, we create a matched sample using a propensity score matching (PSM) method. The covariates in the first stage regression are firm age, total assets, leverage, FFO-to-assets, dividend yield, as well as whether the firm is an umbrella REIT. Following Eichholtz and Kok (2008), we ensure that no REIT that is targeted later during the sample period can be used as a part of the matched sample. We then create a matched sample using the propensity scores with the two nearest neighbors and without replacement. We then test whether there is a difference between the price-to-NAV ratio of targeted firms and that of matched peers in both a difference of means and a logistic regression approach.

To test our second hypotheses of whether price-to-NAV ratios impact public and private deal premiums, we use the ordinary least squares (OLS) regression model described in Equation (1) below:

Table 2. Deal characteristics.

Deal characteristics						
	N	Mean	Std. Dev.	25th	Median	75th
Deal Value (in $ million)	79	$1,979	$2,968	$461	$1,081	$2,555
DVPS	79	$27.34	$17.31	$14.20	$23.00	$37.75
Private Deal Premium	79	1.10	0.20	0.98	1.09	1.24
Public Deal Premium	79	1.15	1.17	1.05	1.12	1.21
% Cash	79	0.75	0.40	0.52	1	1
% Stock	79	0.25	0.40	0	0	0.48
All Cash	79	0.67	0.47	0	1	1
All Stock	79	0.09	0.29	0	0	0

Note: Table 2 presents deal characteristics for acquired REITs from 2001 to 2017 with adequate nonmissing data. All variables are defined in Appendix A.

$$\begin{aligned} Public\ (Private) Deal\ Premium_i = \ & \beta_0 + \beta_1 P/NAV\ measure_i + \ \beta_2 Public\ Acquirer_{\mathrm{i}} + \ \beta_3 UPREIT_{\mathrm{i}} + \ \beta_4 \delta_{\mathrm{i}} \\ & + \beta_5 ln(Firm\ Age_{i,t-1}) + \ \beta_6 ln\ (Total\ Assets_{i,t-1}) + \ \beta_7 Leverage_{i,t-1} \\ & + \ \beta_8 FFO/TA_{i,t-1} + \ \beta_9 Dividend\ Yield_{i,t-1} + S_i + Y_i + \ \varepsilon_{\mathrm{i.}} \end{aligned} \tag{1}$$

where the dependent variable *Public Deal Premium* is computed as the deal value divided by the target's stock price 28 trading days before announcement and *Private Deal Premium* is the deal value divided by the NAV. P/NAV_i *measure* is one of our three price-to-NAV ratios including *Firm* P/NAV_i, the firm's own price-to-NAV ratio; *Firm-Sector* P/NAV_i, the difference between the firm's price-to-NAV ratio and the average price-to-NAV ratio of REITs within the same sector during the same time period; *Firm-Market* P/NAV_i, the difference between the firm's price-to-NAV ratio and the average price-to-NAV ratio of all REITs during the same time period. *Public Acquirer*$_i$ is an indicator variable equal to 1 if the acquirer is listed on a stock exchange, 0 otherwise. $UPREIT_i$ is an indicator variable equal to 1 if the target operates under an umbrella partnership structure, 0 otherwise. δ_i is a vector of deal characteristics including *all-cash*$_i$, an indicator variable equal to 1 if the deal was paid for using cash only, and *all-stock*$_i$ an indicator variable equal to 1 if the deal was paid for using equity only. $Firm\ Age_{i,t-1}$ is the number of years the REIT has been in operation. We use $Total\ Assets_{i,t-1}$ as a proxy for size, $Leverage_{i,t-1}$ to control for capital structure, and $FFO/TA_{i,t-1}$ as a measure of profitability. $Dividend\ Yield_{i,t-1}$ controls for the firm's payout policy. We also add property type fixed effects (S_j) to control for sectorwide phenomenon and year fixed effects (Y_i) to control for time-invariant potential economy-wide shocks.

To test Hypothesis 2a and 2b, the coefficient of interest is β_1. A positive value would indicate REITs trading at premiums to NAV command greater public (private) deal premiums and a negative value would indicate REITs trading at discounts to NAV command greater public (private) deal premiums.

To test our third hypothesis, we investigate target CARs around deal announcement dates. The model is identical to Equation (1) except the dependent variable is the target CAR rather than the deal premium.

$$\begin{aligned} Target\ CAR_i = \ & \beta_0 + \beta_1 P/NAV\ measure_i + \beta_2 Public\ Acquirer_{\mathrm{i}} + \ \beta_3 UPREIT_{\mathrm{i}} + \ \beta_4 \delta_{\mathrm{i}} \\ & + \beta_5 ln(Firm\ Age_{i,t-1}) + \ \beta_6 ln\ (Total\ Assets_{i,t-1}) + \ \beta_7 Leverage_{i,t-1} \\ & + \ \beta_8 EBITDA/TA_{i,t-1} + \ \beta_9 Dividend\ Yield_{i,t-1} + S_i + Y_i + \ \varepsilon_{\mathrm{i.}} \end{aligned} \tag{2}$$

where *Target CAR* is the cumulative abnormal returns over a 3-day and 5-day window. CARs are calculated using a market model with CAPM as the benchmark model. The remaining variables are identical to the model in Equation (1). Similarly, the coefficient of interest is β_1.

Results

To test whether there is a relation between the price-to-NAV ratio and takeover likelihood, we start by comparing the mean price-to-NAV ratio for targeted firms compared to the universe of equity REITs. The results of this unmatched sample difference of means are tabulated in Table 3. In Panel A, we document how the two samples differ on key firm characteristics. The two samples differ in three statistically significant ways.

REITs that are ultimately targeted are younger, smaller, and less profitable. Each of these is consistent with intuition and with the findings documented in prior literature (Eichholtz & Kok, 2008; Ling & Petrova, 2011).

Panel B presents the difference in means between targeted and the unmatched REIT universe for our three measures of relative valuation. The average price-to-NAV for targeted REITs is 0.960, which indicates that the typical targeted REIT is trading at a 4% discount to its NAV. Similarly, the difference between the price-to-NAV of targeted REITs and the average price-to-NAV of the same property sector during the same period is −0.033. This suggests the typical targeted REIT is trading at a 3.3% lower discount than its property sector peers. Finally, the difference between the price-to-NAV of targeted REITs and the average price-to-NAV of all REITs at the same time period is −0.085 (−8.5%). When compared to the unmatched control sample, each of these values is lower than the control group, suggesting targeted firms tend to trade at discounts to NAV. However, only the price-to-NAV relative to the marketwide NAV is statistically significant.

Given the control group differs along various key dimensions to the treatment group, the naïve difference of means between these groups is not an apples-to-apples comparison. Therefore, we next create a matched sample to compare firms more adequately. Specifically, we utilize a PSM empirical method where the covariates are key firm control variables we seek to match on. In the first stage regression, we run a logistic regression model where the dependent variable is an indicator variable that takes the value of 1 when a REIT is a takeover target and 0 otherwise. The first stage regression is reported in Panel A of Table 4. Consistent with the difference of means in Table 3, the dominant differences that drive the propensity to be targeted are firm age and firm size, although FFO-to-assets is negative but insignificant. We then create propensity scores and match the two nearest neighbors without replacement. We exclude REITs that are ultimately targeted later in the sample period from being a part of the matched sample.

Panel B of Table 4 produces the difference of means of firm characteristics between the treatment and the propensity matched control group. If the procedure was success-

Table 3. Unmatched sample difference of means.

Panel A: Sample balance Variable	Treatment	Control	Difference	*T*-stat
UPREIT	0.886	0.822	0.064	1.5
Firm age	2.189	2.630	−0.441***	−8.0
Ln Total Assets	14.270	14.672	−0.402***	−3.4
Leverage	0.545	0.523	0.021	−1.4
FFO to assets	0.043	0.053	−0.010***	−3.3
Dividend yield	0.057	0.056	0.001	−0.3

Panel B: P/NAV difference of means				
	Treatment	Control	Difference	*T*-stat
Firm Price-to-NAV	0.960	1.001	−0.040	−1.5
Firm/Sector Price-to-NAV	−0.033	−0.003	−0.030	−1.4
Firm/Market Price-to-NAV	−0.085	−0.004	−0.081***	−2.9

Note: Table 3 presents the difference of means between treatment firms (REITs that are targeted) and an unmatched control group. The control group includes all equity REITs from 2001 to 2017 in the S&P Global universe with non-missing data. Panel A presents the difference in means for the control variables and Panel B presents the difference of means for the variables of interest. All variables are defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

ful in matching, we expect to find no significant differences across these characteristics. Consistent with a successful matching process, we find no statistically significant differences between the treatment group and control group. Panel C of Table 4 presents the difference of means for our variables of interest.

We find that with the apples-to-apples comparison, the differences between treatment and control REITs for all three measures of price-to-NAV are now statistically significant beyond the 5% level. Economic magnitudes are nontrivial. Targeted REITs are an average of 5.8% lower price-to-NAV than their matched sample. This represents a clear economically meaningful difference. For the sector adjusted and market adjusted NAVs the differences are 4.2% and 8.6%, respectively. The firm relative to the marketwide NAV continues to be the most significant, suggesting REITs trading at discounts relative to the marketwide discount or premium are especially attractive to potential acquirers.

Finally, we run a logistic regression on the treated and matched sample to test whether the result hold in the multivariate setting. The dependent variable takes the value of 1 if the REIT was acquired and 0 otherwise. Consistent with the different of means analysis, we find that REITs trading at discounts are more likely to be acquired. The results can be found in Panel D of Table 4. Apart from Column 5 (firm-sector NAV with fixed effects), each of the regressions have statistically significant negative loadings

Table 4. Propensity score matching (PSM) sample difference of means.

Panel A: Propensity scores first stage

Variable	Coefficient
UPREIT	0.20
	(1.0)
Ln Firm age	−0.76***
	(−5.7)
Ln Total Assets	−0.17**
	(−2.3)
Leverage	0.45
	(0.9)
FFO to assets	−3.41
	(−1.4)
Dividend Yield	2.91
	(1.0)
Year FE	Yes
Property FE	Yes
N	1,779
Adjusted R^2	0.16

Panel B: Matched sample balance

Variable	Treatment	Control	Difference	*T*-stat
UPREIT	0.886	0.924	−0.038	−0.8
Ln Firm age	2.189	2.185	0.005	0.1
Ln Total Assets	14.270	14.163	0.107	0.7
Leverage	0.545	0.552	−0.007	−0.3
FFO to assets	0.043	0.047	−0.003	−0.8
Dividend yield	0.057	0.058	−0.001	−0.2
N	79	158		

Panel C: P/NAV difference of means

Firm Price-to-NAV	0.960	1.018	−0.058***	2.4
Firm/Sector Price-to-NAV	−0.033	0.009	−0.042**	−2.2
Firm/Market Price-to-NAV	−0.085	0.001	−0.086***	−3.4

Panel D: Propensity scores – Multivariate setting						
P/NAV	−2.01***			−1.87*		
	(−2.3)			(−1.7)		
Firm-Sector P/NAV		−1.77*			−1.4	
		(−1.7)			(−1.2)	
Firm-Market P/NAV			−3.36***			−4.17***
			(−3.5)			(−3.7)
UPREIT	−0.54	−0.48	−0.56	−0.44	−0.44	−0.48
	(−1.1)	(−1.0)	(−1.1)	(−0.8)	(−0.8)	(−0.9)
Ln Firm age	−0.04	−0.04	−0.13	−0.05	−0.05	−0.02
	(−0.1)	(−0.2)	(−0.5)	(−0.2)	(−0.2)	(−0.1)
Ln Total Assets	0.08	0.08	0.1	−0.01	−0.03	0.05
	−0.5	(0.5)	(0.6)	(−0.1)	(−0.2)	(0.3)
Leverage	−1.00	−0.88	−1.48	−0.68	−0.65	−1.34
	(−0.7)	(−0.6)	(−1.2)	(−0.5)	(−0.5)	(−1)
FFO to assets	−2.23	−3.47	−1.68	−1.16	−1.71	−0.64
	(−0.3)	(−0.5)	(-0.3)	(−0.2)	(−0.2)	(−0.1)
Dividend Yield	0.92	0.91	3.63	1.36	1.76	1.2
	−0.1	(0.1)	(0.6)	(0.2)	(0.2)	(0.2)
Year FE	No	No	No	Yes	Yes	Yes
Property FE	No	No	No	Yes	Yes	Yes
N	237	237	237	237	237	237
Adjusted R^2	0.03	0.02	0.06	0.06	0.05	0.10

Note: Table 4 presents the difference of means for the propensity score matched sample. The treatment group includes all REITs acquired from 2001 to 2017 and the treatment group includes a matched sample based on the PSM matching procedure (defined in the empirical methods section). Panel A presents the first-stage logit regression for the PSM. Panel B presents the difference of means for the control variables. Panel C presents the difference of means for the variables of interest. Panel D is the multivariate regression using the PSM sample. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

on the price-to-NAV ratio. Overall, we interpret this evidence as consistent with our hypothesis that REITs trading at discounts are more likely to be targeted.

We next test our Hypotheses 2 and 3 regarding how deal premiums and target wealth effects are impacted by price-to-NAV ratios. Results for univariate analysis are found in Table 5. We begin by splitting the sample into three groups based on their price-to-NAV ratio. Group 1 has price-to-NAV below 0.95, Group 2 is between 0.95 and 1.05, and Group 3 is above 1.05. We first note that the largest group is that with the price-to-NAV below 0.95 with 36 takeovers compared to 19 and 24 takeovers for Groups 2 and 3, respectively. We then calculate the mean public deal premium, private deal premium, and target [−1,+1] announcement CARs for each group.

The public deal premium is decreasing monotonically from Group 1 to Group 3. REITs purchased in Group 1 were sold at a premium of 19% compared to 12% in Group 2 and 11% in Group 3. This suggests a negative relation between the price-to-NAV ratio and the public deal premium. The relation between public deal premiums and price-to-NAV ratios is critical because it allows one to differentiate between the NAV Anchoring and Bargaining Power hypotheses. A negative relation supports NAV Anchoring and refutes Bargaining Power. Target CARs decrease monotonically from Group 1 to 3 even more dramatically. REITs trading at the greatest discount receive shareholder responses of 17% in the 3-day trading window. This compares to 8% and 6% in Group 2 and 3, respectively. Finally, the private deal premium increases monotonically across the three groups. Specifically, REITs acquired trading at discounts to NAV are purchased at an average deal value to NAV of 0.97, suggesting acquirers are able to pay below NAV for the REIT. For

Table 5. Univariate analysis.

	N	Mean	Median	Mean diff 1 v 2	Mean diff 1 v 3
Panel A: Low P/NAV (Group 1: Price-to-NAV < 0.95)					
Price-to-NAV	36	0.83	0.87	***	***
Firm/Sector Price-to-NAV	36	−0.11	−0.11	***	***
Firm/Market Price-to-NAV	36	−0.21	−0.16	***	***
Public Deal Premium	36	1.19	1.16	*	*
CARs	36	0.17	0.09	*	*
Private Deal Premium	36	0.97	0.97	***	***
Panel B: Medium P/NAV (Group 2: 0.95 < Price-to-NAV < 1.05)					
Price-to-NAV	19	0.98	0.97	***	***
Firm/Sector Price-to-NAV	19	−0.02	−0.05	***	***
Firm/Market Price-to-NAV	19	−0.08	−0.03	***	***
Public Deal Premium	19	1.12	1.11	*	
CARs	19	0.08	0.08	*	
Private Deal Premium	19	1.13	1.14	***	***
Panel C: High P/NAV (Group 3: Price-to-NAV > 1.05)					
Price-to-NAV	24	1.14	1.11	***	***
Firm/Sector Price-to-NAV	24	0.07	0.06	***	***
Firm/Market Price-to-NAV	24	0.09	0.08	***	***
Public Deal Premium	24	1.11	0.12	*	
CARs	24	0.06	0.07	*	
Private Deal Premium	24	1.29	1.28	***	***

Note: Table 5 presents the difference of means between three groups of REITs that were acquired between 2001 and 2017. The first group includes REITs that were trading at a price-to-NAV below 0.95. The second group has price-to-NAV ratios between 0.95 and 1.05. The third group has price-to-NAV ratios above 1.05. Each variable is defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

the REITs in Groups 2 and 3, deal values are well above NAV at 1.13 and 1.29, respectively. Targeted REITs benefit because they command greater public deal premiums and shareholders applaud the decision. Acquirers benefit because they are able to purchase the REIT at or near the NAV. Taken together, the univariate results support the NAV Anchoring hypothesis.

We add rigor to the analysis by controlling for potentially confounding variables using multivariate analysis. Table 6 presents results from the regressions of each price-to-NAV ratio on public deal premiums controlling for firm characteristics and deal characteristics. For each result, we estimate the regression with and without year and sector fixed effects. Additionally, we examine sector and market-adjusted price-to-NAV ratios along with the original price-to-NAV. For each of the price-to-NAV measures, the coefficients are negative and statistically significant, suggesting REITs trading greater discounts (lower price-to-NAV ratios) command greater public deal premiums. The coefficients are economically meaningful. In the result including both sector and year fixed effects, a 1% increase in the price-to-NAV leads to a decrease in the deal premium of −0.81%. Again, the negative relation between price-to-NAV ratios supports the NAV Anchoring hypothesis and provides contradictory evidence for the Bargaining Power hypothesis.

Next, we examine the relation between price-to-NAV ratios and private deal premiums in the multivariate setting. We utilize the same regression framework and control variable used in the public deal premium regression. Results are tabulated in Table 7. Regardless of the measure of price-to-NAV, we find a positive and statistically significant relation between the price-to-NAV ratio and the private deal premium. This finding suggests that acquirers are able to purchase REITs with low price-to-NAV ratios at attractive

Table 6. The effect of price-to-NAV ratios on public deal premiums.

	Public deal premium (Deal Value/Stock Price)								
P/NAV	−0.63***	−0.79***	−0.81***						
	(−5.7)	(−5.1)	(−5.2)						
Firm-Sector P/NAV				−0.59***	−0.55***	−0.52**			
				(−3.6)	(−3.1)	(−2.5)			
Firm-Market P/NAV							−0.26**	−0.47**	−0.49***
							(−2.3)	(−2.7)	(−2.7)
Public acquirer	−0.07	−0.02	−0.01	−0.05	−0.03	−0.02	−0.06	−0.02	−0.02
	(−1.6)	(−0.4)	(−0.2)	(−1)	(−0.6)	(−0.4)	(−1.1)	(−0.5)	(−0.4)
UPREIT	0.04	0.04	0.05	0.07	0.04	0.03	0.03	0.02	0.03
	(0.8)	(0.8)	(0.8)	(1.1)	(0.8)	(0.5)	(0.4)	(0.3)	(0.4)
All-cash	−0.02	0.04	0.07	0.00	0.05	0.07	−0.01	0.03	0.05
	(−0.5)	(0.8)	(1.4)	(0.0)	(1.0)	(1.2)	(−0.2)	(0.6)	(0.9)
All-stock	−0.06	0.04	0.00	−0.06	0.05	0.01	−0.07	0.01	−0.02
	(−0.8)	(0.6)	(0.1)	(−0.8)	(0.7)	(0.1)	(−0.8)	(0.2)	(−0.2)
Ln Firm age	0.04	0.04	0.05	0.02	0.04	0.04	0.00	0.03	0.05
	(1.2)	(1.3)	(1.7)	(0.6)	(1.1)	(1.1)	(0.1)	(0.9)	(1.4)
Ln Total assets	−0.02	0.01	0.02	−0.01	0.00	0.01	−0.02	0.00	0.00
	(−0.7)	(0.5)	(0.7)	(−0.4)	(0.2)	(0.4)	(−0.6)	(0.1)	(0.2)
Leverage	0.06	−0.02	0.01	0.09	−0.02	0.01	0.04	0.01	0.03
	(0.5)	(−0.1)	(0.1)	(0.7)	(−0.2)	(0.1)	(0.3)	(0.1)	(0.2)
FFO/TA	0.63	1.02*	0.95	0.48	0.64	0.56	0.03	0.63	0.49
	(1.1)	(1.8)	(1.6)	(0.7)	(1.0)	(0.8)	(0)	(1.0)	(0.7)
Dividend Yield	−0.39	−0.91	−1.07	−0.15	−0.64	−0.66	0.17	−0.67	−0.86
	(−0.7)	(−1.5)	(−1.5)	(−0.2)	(−0.9)	(−0.8)	(0.2)	(−1.0)	(−1.0)
Sector FE	No	No	Yes	No	No	Yes	No	No	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
N	79	79	79	79	79	79	79	79	79
Adjusted R^2	0.259	0.437	0.444	0.082	0.294	0.238	−0.012	0.264	0.249

Note: Table 6 presents results from ordinary least squares (OLS) regressions of price-to-NAV ratios on public deal premiums (deal value relative to stock price), looking at the raw price-to-NAV value, the price-to-NAV relative to peer REITs in the same property sector-year, and the price-to-NAV relative to the marketwide price-to-NAV in the same year. Regressions each include year and sector fixed effects. Each variable is defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

private deal premiums. Similar to the results with the public deal premium, the findings are economically meaningful. A 1% increase in the price-to-NAV ratio is equal to a 0.63% increase the private deal premium in the regression with both sector and year fixed effects. While the results differ somewhat in magnitude with the sector and market-adjusted NAV measures, the direction and statistical significance are quite consistent.

Table 8 presents a similar regression framework but with target CARs as the dependent variable. Regardless of model specification or price-to-NAV measure, we document a negative and significant relation between price-to-NAV ratios and target CARs. This suggests that REITs trading at discounts to NAV lead to greater target CARs at deal announcement. The economic magnitudes are meaningful and are similar to the public deal premium regressions. In the specification with both year and sector fixed effects, a 1% increase in the price-to-NAV ratio decreases the target 3-day CAR by 0.77%. Overall, these results suggest REITs trading at discounts to NAV are more likely to be targeted, command greater deal premiums, and have shareholders respond more favorably to their announcement.

Robustness

To conclude the analysis, we perform various robustness tests to ensure our results are not spurious. Table 9 presents the results of these analyses. We first seek to ensure the

Table 7. The effect of price-to-NAV ratios on private deal premium.

	Private deal premium (Deal Value/NAV)								
P/NAV	0.93***	0.68***	0.63***						
	(10.5)	(4.8)	(4.5)						
Firm-Sector P/NAV				0.84***	0.56***	0.64***			
				(5.1)	(3.6)	(4.1)			
Firm-Market P/NAV							0.65***	0.71***	0.69***
							(6.7)	(5.2)	(5.2)
Public acquirer	0.00	0.04	0.06	−0.03	0.05	0.06	0.00	0.04	0.07*
	(0.00)	(0.9)	(1.5)	(−0.5)	(1.1)	(1.5)	(0.0)	(1)	(1.7)
UPREIT	0.00	0.02	0.00	−0.03	0.02	0.00	0.03	0.04	0.01
	(0.1)	(0.5)	(−0.1)	(−0.5)	(0.3)	(0.1)	(0.6)	(0.9)	(0.3)
All-cash	0.03	0.06	0.09**	0.00	0.05	0.10**	0.02	0.09*	0.13***
	(0.7)	(1.2)	(2.1)	(−0.1)	(1.0)	(2.1)	(0.5)	(1.9)	(2.9)
All-stock	−0.07	−0.04	−0.08	−0.06	−0.05	−0.08	−0.05	0.01	−0.04
	(−1.2)	(−0.6)	(−1.1)	(−0.8)	(−0.7)	(−1.2)	(−0.7)	(0.1)	(−0.6)
Ln Firm age	0.00	0.00	0.00	0.03	0.00	0.01	0.05*	0.01	0.00
	(0.1)	(0.1)	(0)	(0.9)	(0.2)	(0.4)	(1.8)	(0.3)	(−0.1)
Ln Total assets	0.02	0.02	0.03	0.01	0.02	0.03	0.02	0.02	0.04*
	(0.9)	(0.9)	(1.6)	(0.2)	(1)	(1.4)	(0.9)	(1.1)	(1.9)
Leverage	0.02	0.03	0.06	−0.02	0.04	0.08	0.13	0.01	0.06
	(0.3)	(0.3)	(0.6)	(−0.2)	(0.4)	(0.8)	(1.1)	(0.1)	(0.6)
FFO/TA	0.48	0.89*	0.98*	0.76	1.11**	0.92*	0.98*	0.8	0.90*
	(1.1)	(1.8)	(1.9)	(1.2)	(2.1)	(1.7)	(1.7)	(1.6)	(1.9)
Dividend Yield	0	−0.03	0.16	−0.37	−0.23	−0.11	−1.01*	−0.08	0.17
	(0)	(−0.1)	(0.2)	(−0.6)	(−0.4)	(−0.2)	(−1.7)	(−0.1)	(0.3)
Sector FE	No	No	Yes	No	No	Yes	No	No	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
N	79	79	79	79	79	79	79	79	79
Adjusted R^2	0.640	0.639	0.67	0.323	0.587	0.65	0.435	0.655	0.697

Note: Table 7 presents results from ordinary least squares (OLS) regressions of price-to-NAV ratios on private deal premiums (deal value relative to NAV), looking at the raw price-to-NAV value, the price-to-NAV relative to peer REITs in the same property sector-year, and the price-to-NAV relative to the marketwide price-to-NAV in the same year. Regressions each include year and sector fixed effects. Each variable is defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

results are not sensitive to the timing of the price-to-NAV measure. In our baseline analysis, we calculate the price-to-NAV ratio as of 28 days before the deal announcement. This is done to avoid the run-up period in which the stock price changes in response to expectations of a deal ensuing. However, the selection of 28 days is somewhat arbitrary. To alleviate this concern, we estimate the price-to-NAV as of 20 days and 40 days before the announcement. We then reestimate Equation (1) using the new price-to-NAV variable.

Panel A presents the results of this test with the public premium as the dependent variable. Consistent with the baseline results, the relation between each measure of the price-to-NAV ratio and the public deal premium is negatively and statistically significant. Similarly, Panel B presents the same regression, but with the private deal premium as the dependent variable. Results are also consistent with the baseline results and display a positive and statistically significant relation between the price-to-NAV ratio and the private deal premium. Finally, our regressions of target CARs on price-to-NAV ratios utilizes the market model to estimate abnormal returns. To mitigate the concern the result is driven by the selection of benchmark model, we reestimate Equation (2) using both value-weighted and equal-weighted market-adjusted returns. Results in Panel C are consistent with our baseline results.

Table 8. The effect of price-to-NAV ratios on target CARs.

	CAR [−1 ; 1]								
P/NAV	−0.88***	−0.74***	−0.77***						
	(−5.2)	(−4)	(−4.1)						
Firm-Sector P/NAV				−0.82***	−0.65***	−0.57**			
				(−3.2)	(−3.3)	(−2.5)			
Firm-Market P/NAV							−0.32*	−0.41**	−0.45**
							(−1.8)	(−2)	(−2.1)
Public acquirer	−0.1	0	−0.02	−0.07	−0.02	−0.03	−0.08	−0.01	−0.03
	(−1.4)	(−0.1)	(−0.4)	(−1)	(−0.3)	(-0.5)	(−1)	(−0.2)	(−0.6)
UPREIT	0.1	0.09	0.13**	0.14	0.1	0.12*	0.08	0.07	0.11
	(1.2)	(1.5)	(2)	(1.4)	(1.6)	(1.7)	(0.9)	(1.1)	(1.6)
All-cash	−0.06	0.09	0.11*	−0.03	0.10	0.12*	−0.04	0.08	0.1
	(−0.7)	(1.5)	(1.9)	(−0.3)	(1.6)	(1.7)	(−0.4)	(1.2)	(1.5)
All-stock	−0.13	0.05	0.05	−0.14	0.06	0.06	−0.15	0.03	0.03
	(−1.2)	(0.6)	(0.5)	(−1.1)	(0.8)	(0.5)	(−1.1)	(0.3)	(0.3)
Ln Firm age	0.04	0.05	0.07*	0.02	0.05	0.06	0	0.04	0.07
	(0.9)	(1.5)	(1.8)	(0.3)	(1.4)	(1.4)	(−0.1)	(1.1)	(1.6)
Ln Total assets	−0.06*	−0.01	−0.02	−0.05	−0.02	−0.02	−0.06	−0.02	−0.03
	(−1.7)	(−0.5)	(−0.6)	(−1.3)	(−0.6)	(-0.6)	(−1.5)	(−0.7)	(−0.9)
Leverage	0.11	−0.04	−0.03	0.15	−0.06	−0.04	0.1	−0.01	−0.01
	(0.6)	(−0.3)	(−0.2)	(0.8)	(−0.4)	(-0.2)	(0.5)	(−0.1)	(0)
FFO/TA	0.56	0.71	0.61	0.33	0.51	0.36	−0.35	0.31	0.14
	(0.6)	(1.1)	(0.9)	(0.3)	(0.8)	(0.5)	(−0.4)	(0.4)	(0.2)
Dividend Yield	−0.25	−1.47**	−2.03**	0.1	−1.27*	−1.66*	0.51	−1.24	−1.82*
	(−0.3)	(−2)	(−2.3)	(0.1)	(−1.7)	(−1.8)	(0.5)	(−1.6)	(−1.9)
Sector FE	No	No	Yes	No	No	Yes	No	No	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
N	79	79	79	79	79	79	79	79	79
Adjusted R^2	0.250	0.653	0.662	0.094	0.627	0.596	0.004	0.585	0.582

Note: Table 8 presents results from ordinary least squares (OLS) regressions of price-to-NAV ratios on target cumulative abnormal returns (CARs) around the announcement date of the transaction.), looking at the raw price-to-NAV value, the price-to-NAV relative to peer REITs in the same property sector-year, and the price-to-NAV relative to the market wide price-to-NAV in the same year. Regressions each include year and sector fixed effects. Each variable is defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

Table 9. Robustness.

	P/NAV 20 days			P/NAV 40 days		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: P/NAV computation robustness – Public premium						
P/NAV	−0.76***			−0.70***		
	(−4.7)			(−3.8)		
Firm-Sector P/NAV		−0.47**			−0.46**	
		(−2.5)			(−2.0)	
Firm-Market P/NAV			−0.43**			−0.43**
			(−2.6)			(−2.2)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	79	79	79	79	79	79
Adjusted R^2	0.410	0.233	0.241	0.335	0.204	0.216
Panel B: P/NAV computation robustness – Private premium						
P/NAV	0.66***			0.61***		
	(5.0)			(4.0)		
Firm-Sector P/NAV		0.65***			0.64***	
		(4.6)			(3.7)	
Firm-Market P/NAV			0.61***			0.63***
			(5.1)			(4.4)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	79	79	79	79	79	79
Adjusted R^2	0.691	0.671	0.695	0.645	0.631	0.663

	Value-weighted			Equal-weighted		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel C: Market adjusted returns						
P/NAV	−0.22***			−0.23***		
	(−3.4)			(−3.2)		
Firm-Sector P/NAV		−0.15**			−0.18**	
		(−2.1)			(−2.1)	
Firm-Market P/NAV			−0.13**			−0.18**
			(−2.1)			(−2.3)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	79	79	79	79	79	79
Adjusted R^2	0.470	0.400	0.396	0.461	0.400	0.408

Note: Table 9 presents results from a battery of robustness tests replicating the main results. Panel A (Panel B) reports the results of our base regression on the public premium (private premium) computed as of 20 and 40 days before announcement. Panel C reports the results of our base regression on the performance at announcement using market adjusted returns (value weighted and equal weighted). Regressions each include year and sector fixed effects and robust standard errors. Each variable is defined in Appendix A. ***, **, and * denote significance of coefficients at the 1%, 5%, and 10% levels, respectively.

Finally, we examine how public and private deal premiums vary by market conditions. We define hot and cold market conditions for the REIT industry by splitting the sample on the median based on NAREIT REIT index annual returns. We then calculate the average and median public and private deal premium within each group. The results are presented in Figure 2. We observe that public premiums are notably higher in cold market conditions and private premiums are notably higher in hot market conditions. These results further corroborate the Anchoring hypothesis. When markets are hot, valuations tend to be are higher, and public deal premiums tend to be lower as investors anchor to the NAV rather than elevated public market valuations. Similarly, private deal premiums are lower in cold markets as investors are able to acquire the REIT at attractive private deal premiums when markets are cold, and valuations are relatively low.[8]

Conclusion

M&A transactions are among the most important decisions acquirers and targets make during the firm's life cycle. A thorough understanding of which firms get targeted and how those deals are negotiated is a first-order concern for all parties involved. We are the first to our knowledge to investigate the role of relative valuation between public and private markets on REIT M&A. Consistent with anecdotal evidence, we document that REITs trading at discounts to NAV are more likely to be targeted in M&A transactions. We provide evidence suggesting this occurs because REITs with lower price-to-NAV ratios command smaller private deal premiums and larger public deal premiums. Acquirers can purchase the REIT at attractive valuations relative to the private market value and target shareholders are satisfied to sell at adequate premiums to their current stock price. Finally, we show that target shareholders respond more favorably to M&A announcements when they are trading at discounts to NAV.

Further work is needed to understand the role of parallel markets on REIT M&A. The focus of our article is on REITs targeted that are trading at discounts to NAV, yet we document a nontrivial number of transactions that occur at premiums to NAV. What

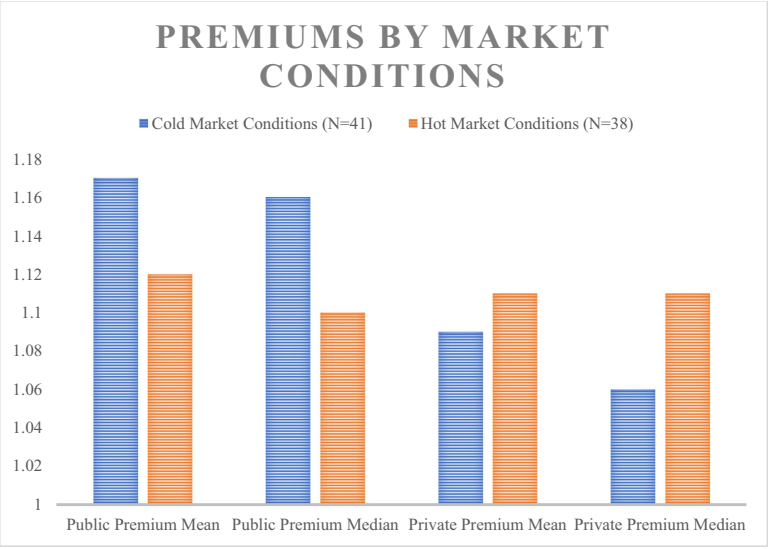


Figure 2. This figure displays the mean and median public and private deal premium split by market conditions. Market conditions are measured by the NAREIT return in a given year. Market conditions are defined as hot when NAREIT has above median returns and cold when NAREIT has below median returns.

drives the decisionmaking process to acquire these REITs trading at seemingly unattractive valuations? Additionally, how price-to-NAV ratios interact with other REIT factors known to impact M&A, such as governance structure, institutional ownership, asset location, and more, is worthy of additional investigation.

Notes

1. Note from both the Cohen and Steers quote and the L&B example that the usefulness of the NAV is not only for public-to-private "arbitrage" transactions, but also for public-to-public transactions where the NAV serves as a measure of intrinsic value.
2. The stock price of the target is usually lagged to reduce the impact of information leading up to the announcement from estimating the target;s baseline value (i.e., the run-up).
3. Allen & Sirmans, 1987; McIntosh et al., 1989, Elayan & Young, 1994; Campbell et al., 2001; Li et al., 2001; Sahin, 2005; Campbell et al., 2005; Eichholtz & Kok, 2008; Campbell et al., 2009; Campbell et al., 2011; Ling & Petrova, 2011; Womack, 2012.
4. REIT A private deal premium = \$112/\$91 = 1.21. REIT B private deal premium = \$112/\$111 = 1.01. NAVs for each are calculated based on stock price of \$100 and price-to-NAV of 1.10 and 0.90.
5. Notably, a positive relation between price-to-NAV ratios and private deal premiums does not allow us to differentiate between the NAV Anchoring and Bargaining Power hypotheses. However, the hypotheses predict opposite relations between price-to-NAV ratios and public deal premiums. Specifically, a positive relation between public deal premiums and price-to-NAV ratios supports the Bargaining Power hypothesis and a negative relation supports the NAV Anchoring hypothesis.
6. While it would be productive to examine wealth effects of the acquirer, we are unable to test this with accuracy due to a limited number of REIT acquisitions with adequate NAV data from public acquirers.

7. Given the small sample size, 12 of the deals with available NAV data and deal characteristics were missing a few control variables. We hand collected those variables from Bloomberg to allow them to remain in the sample.
8. In untabulated analysis, we reestimate the regressions in Tables 6, 7, and 8 removing control variables and fixed effects. The results continue to be directionally and statistically significant.

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References

Allen, P. R., & Sirmans, C. F. (1987). An analysis of gains to acquiring firm's shareholders: The special case of REITs. *Journal of Financial Economics*, *18*(1), 175–184. https://doi.org/10.1016/0304-405X(87)90067-5

Ambrose, B. W., & Megginson, W. L. (1992). The role of asset structure, ownership structure, and takeover defenses in determining acquisition likelihood. *Journal of Financial and Quantitative Analysis*, *27*(4), 575–589. https://doi.org/10.2307/2331141

Anderson, R., Clayton, J., Mackinnon, G., & Sharma, R. (2005). REIT returns and pricing: The small cap value stock factor. *Journal of Property Research*, *22*(04), 267–286. https://doi.org/10.1080/09599910600558454

Baker, M., Pan, X., & Wurgler, J. (2012). The effect of reference point prices on mergers and acquisitions. *Journal of Financial Economics*, *106*(1), 49–71. https://doi.org/10.1016/j.jfineco.2012.04.010

Barkham, R., & Ward, C. (1999). Investor sentiment and noise traders: Discount to net asset value in listed property companies in the UK. *Journal of Real Estate Research*, *18*(2), 291–312. https://doi.org/10.1080/10835547.1999.12090996

Bates, T. W., Becher, D. A., & Lemmon, M. L. (2008). Board classification and managerial entrenchment: Evidence from the market for corporate control. *Journal of Financial Economics*, *87*(3), 656–677. https://doi.org/10.1016/j.jfineco.2007.03.007

Boudry, W. I., Kallberg, J. G., & Liu, C. H. (2010). An analysis of REIT security issuance decisions. *Real Estate Economics*, *38*(1), 91–120. https://doi.org/10.1111/j.1540-6229.2009.00255.x

Brounen, D., Ling, D. C., & Prado, M. P. (2013). Short sales and fundamental value: Explaining the REIT premium to NAV. *Real Estate Economics*, *41*(3), 481–516. https://doi.org/10.1111/reec.12004

Business Wire. (2015, December 3). *Land and Buildings comments on merger with American Residential Properties and American Homes 4 Rent*. https://www.businesswire.com/news/home/20151203005913/en/Land-Buildings-Comments-on-Merger-With-American-Residential-Properties

Campbell, R. (2002). Shareholder wealth effects in equity REIT restructuring transactions: Sell-offs, mergers and joint ventures. *Journal of Real Estate Literature*, *10*(2), 205–222. https://doi.org/10.1080/10835547.2002.12090114

Campbell, R. D., Ghosh, C., Petrova, M., & Sirmans, C. F. (2011). Corporate governance and performance in the market for corporate control: The case of REITs. *The Journal of Real Estate Finance and Economics*, *42*, 451–480. https://doi.org/10.1007/s11146-009-9202-2

Campbell, R. D., Ghosh, C., & Sirmans, C. F. (2001). The information content of method of payment in mergers: Evidence from real estate investment trusts (REITs). *Real Estate Economics*, *29*(3), 361–387. https://doi.org/10.1111/1080-8620.00015

Campbell, R. D., Ghosh, C., & Sirmans, C. F. (2005). Value creation and governance structure in REIT mergers. *The Journal of Real Estate Finance and Economics*, *31*, 225–239. https://doi.org/10.1007/s11146-005-1373-x

Campbell, R. D., Giambona, E., & Sirmans, C. F. (2009). The long-horizon performance of REIT mergers. *The Journal of Real Estate Finance and Economics*, *38*, 105–114. https://doi.org/10.1007/s11146-007-9085-z

Capozza, D., & Korean, S. (1995). Property type, size and REIT value. *Journal of Real Estate Research*, *10*(4), 363–379. https://doi.org/10.1080/10835547.1995.12090794

Capozza, D. R., & Seguin, P. J. (2003). Inside ownership, risk sharing and Tobin's Q-ratios: Evidence from REITs. *Real Estate Economics*, *31*(3), 367–404. https://doi.org/10.1111/1540-6229.00070

Chacon, R. G., French, D. W., & Pukthuanthong, K. (2021). The information content of NAV estimates. *The Journal of Real Estate Finance and Economics*, *63*, 598–629. https://doi.org/10.1007/s11146-020-09760-x

Clayton, J., & MacKinnon, G. (2001). The time-varying nature of the link between REIT, real estate and financial asset returns. *Journal of Real Estate Portfolio Management*, *7*(1), 43–54. https://doi.org/10.1080/10835547.2001.12089632

Cohen & Steers. (2018). *Riding a wave of REIT M&A in the U.S*. https://web.archive.org/web/20191210234314/ https://www.cohenandsteers.com/insights/read/riding-a-wave-of-reit-ma-us

Cremers, K. M., Nair, V. B., & John, K. (2009). Takeovers and the cross-section of returns. *The Review of Financial Studies*, *22*(4), 1409–1445. https://doi.org/10.1093/rfs/hhn032

Daniels, K., & Phillips, R. (2007). The valuation impact of financial advisors: An empirical analysis of REIT mergers and acquisitions. *Journal of Real Estate Research*, *29*(1), 57–74. https://doi.org/10.1080/10835547.2007.12091189

Dong, M., Hirshleifer, D., Richardson, S., & Teoh, S. H. (2006). Does investor misvaluation drive the takeover market? *The Journal of Finance*, *61*(2), 725–762. https://doi.org/10.1111/j.1540-6261.2006.00853.x

Downs, D. H., Straska, M., & Waller, H. G. (2019). Shareholder activism in REITs. *Real Estate Economics*, *47*(1), 66–103. https://doi.org/10.1111/1540-6229.12242

Edmans, A., Goldstein, I., & Jiang, W. (2012). The real effects of financial markets: The impact of prices on takeovers. *The Journal of Finance*, *67*(3), 933–971. https://doi.org/10.1111/j.1540-6261.2012.01738.x

Eichholtz, P. M., & Kok, N. (2008). How does the market for corporate control function for property companies? *The Journal of Real Estate Finance and Economics*, *36*, 141–163. https://doi.org/10.1007/s11146-007-9061-7

Elayan, F. A., & Young, P. J. (1994). The value of control: Evidence from full and partial acquisitions in the real estate industry. *The Journal of Real Estate Finance and Economics*, *8*, 167–182. https://doi.org/10.1007/BF01097036

Freybote, J., & Qian, L. (2015). The impact of asset location on REIT merger decisions. *Journal of Property Research*, *32*(2), 103–122. https://doi.org/10.1080/09599916.2014.992802

Glascock, J. L., Zhang, Y., & Zhou, T. (2018). A review and extension of merger and acquisition research between REITs and general corporations. *Journal of Real Estate Literature*, *26*(2), 223–253. https://doi.org/10.1080/10835547.2018.12090484

Graff, R. (2001). Economic analysis suggests that REIT investment characteristics are not as advertised. *Journal of Real Estate Portfolio Management*, *7*(2), 99–124. https://doi.org/10.1080/10835547.2001.12089641

Hardin, W. G., & Wu, Z. (2009). Bank mergers, REIT loan pricing and takeover likelihood. *The Journal of Real Estate Finance and Economics*, *38*, 275–301. https://doi.org/10.1007/s11146-008-9150-2

Kim, D., & Wiley, J. A. (2019). NAV premiums & REIT property transactions. *Real Estate Economics*, *47*(1), 138–177. https://doi.org/10.1111/1540-6229.12239

Letdin, M., Sirmans, C. S., & Sirmans, G. S. (2022). Spread too thin: REIT asset dispersion and divergence of opinion. *The Journal of Real Estate Finance and Economics*. Advance online publication. https://doi.org/10.1007/s11146-022-09920-1

Letdin, M., Sirmans, S., & Sirmans, G. S. (2018). *Agree to disagree: NAV dispersion in REITs* [Unpublished manuscript].

Letdin, M., Sirmans, S., & Sirmans, G. S. (2022). Betting against the sentiment in REIT NAV premiums. *The Journal of Real Estate Finance and Economics*, *64* 590–614. https://doi.org/10.1007/s11146-020-09803-3

Li, J., Elayan, F. A., & Meyer, T. O. (2001). Acquisitions by real estate investment trusts as a strategy for minimization of investor tax liability. *Journal of Economics and Finance*, *25*(1), 115–134. https://doi.org/10.1007/BF02759690

Ling, D. C., & Naranjo, A. (2015). Returns and information transmission dynamics in public and private real estate markets. *Real Estate Economics*, *43*(1), 163–208. https://doi.org/10.1111/1540-6229.12069

Ling, D. C., Ooi, J. T., & Xu, R. (2019). Asset growth and stock performance: Evidence from REITs. *Real Estate Economics*, *47*(3), 884–927. https://doi.org/10.1111/1540-6229.12186

Ling, D. C., & Petrova, M. (2011). Why do REITs go private? Differences in target characteristics, acquirer motivations, and wealth effects in public and private acquisitions. *The Journal of Real Estate Finance and Economics*, *43*, 99–129. https://doi.org/10.1007/s11146-010-9295-7

Lu, C., Mao, T., & Shen, Y. P. (2015). Beyond friendly acquisitions: The case of REITs. *Review of Quantitative Finance and Accounting*, *44*, 139–159. https://doi.org/10.1007/s11156-013-0409-1

McIntosh, W., Officer, D., & Born, J. (1989). The wealth effects of merger activities: Further evidence from real estate investment trusts. *Journal of Real Estate Research*, *4*(3), 141–155. https://doi.org/10.1080/10835547.1989.12090597

Mühlhofer, T. (2013). Why do REIT returns poorly reflect property returns? Unrealizable appreciation gains due to trading constraints as the solution to the short-term disparity. *Real Estate Economics*, *41*(4), 814–857. https://doi.org/10.1111/reec.12001

Mulherin, J. H., & Womack, K. S. (2015). Competition, auctions & negotiations in REIT takeovers. *The Journal of Real Estate Finance and Economics*, *50*, 151–180. https://doi.org/10.1007/s11146-013-9447-7

Oikarinen, E., Hoesli, M., & Serrano, C. (2011). The long-run dynamics between direct and securitized real estate. *Journal of Real Estate Research*, *33*(1), 73–104. https://doi.org/10.1080/10835547.2011.12091299

Palepu, K. G. (1986). Predicting takeover targets: A methodological and empirical analysis. *Journal of Accounting and Economics*, *8*(1), 3–35. https://doi.org/10.1016/0165-4101(86)90008-X

Rhodes–Kropf, M., Robinson, D. T., & Viswanathan, S. (2005). Valuation waves and merger activity: The empirical evidence. *Journal of Financial Economics*, *77*(3), 561–603. https://doi.org/10.1016/j.jfineco.2004.06.015

Sahin, O. (2005). The performance of acquisitions in the real estate investment trust industry. *Journal of Real Estate Research*, *27*(3), 321–342. https://doi.org/10.1080/10835547.2005.12091161

Soyeh, K. W., Kim, D., & Gyamfi-Yeboah, F. (2021). The role of debt in REIT equity issuance at a discount to net asset values. *Journal of Real Estate Research*, *43*(2), 226–247. https://doi.org/10.1080/08965803.2021.1925504

Womack, K. S. (2012). Real estate mergers: Corporate control & shareholder wealth. *The Journal of Real Estate Finance and Economics*, *44*, 446–471. https://doi.org/10.1007/s11146-010-9251-6

Yavas, A., & Yildirim, Y. (2011). Price discovery in real estate markets: A dynamic analysis. *The Journal of Real Estate Finance and Economics*, *42*, 1–29. https://doi.org/10.1007/s11146-009-9172-4

Yunus, N., Hansz, J. A., & Kennedy, P. J. (2012). Dynamic interactions between private and public real estate markets: Some international evidence. *The Journal of Real Estate Finance and Economics*, *45*, 1021–1040. https://doi.org/10.1007/s11146-010-9297-5

Appendix A. Variable definitions

Variable	Description
All-cash	An indicator variable equal to 1 if the deal was paid for using cash only, 0 otherwise.
All-stock	An indicator variable equal to 1 if the deal was paid for using equity only, 0 otherwise.
Private deal premium	The ratio of the deal value per share over the target's net asset value 28 trading days before announcement.
Public deal premium	The ratio of the deal value per share over the target's stock price 28 trading days before announcement.
Dividend Yield	Dividend paid over stock price as of the year preceding the announcement.
FFO/TA	The target's Funds From Operations scaled by total assets.
Firm age	The number of years the REIT has been in operation.
Firm P/NAV	The target's price to NAV ratio computed as the target's stock price over the target's NAV estimate 28 trading days before announcement.
Firm-Sector P/NAV	The difference between the firm's price to NAV ratio and the average price to NAV ratio of REITs within the same sector.
Firm-Market P/NAV	The difference between the firm's price to NAV ratio and the average price to NAV ratio of all REITs.
Leverage	The percentage of debt in a REIT capital structure, computed as debt over total assets.
Public Acquirer	An indicator variable equal to 1 if the acquirer is a listed on a stock exchange, 0 otherwise
Target CARs [-1;1]	Cumulative abnormal returns computed using the market model with the CAPM as the benchmark model. The 3-day trading window is centered around the announcement of the merger.
Target CARs [-2;2]	Cumulative abnormal returns computed using the market model with the CAPM as the benchmark model. The 5-day trading window is centered around the announcement of the merger.
Total Assets	The dollar value of the firm's assets (in $million).
UPREIT	An indicator variable equal to 1 if the target operates under an umbrella partnership structure,0 otherwise

Appendix B. Hypothetical deals

Hypothesis	NAV Anchoring		Bargaining Power		NAV Irrelevance	
	Premium REIT	Discount REIT	Premium REIT	Discount REIT	Premium REIT	Discount REIT
Stock Price	$105	$95	$105	$95	$105	$95
NAV	$100	$100	$100	$100	$100	$100
Deal Value	$110	$103	$115	$99	$110	$115
Price/NAV	1.05	0.95	1.05	0.95	1.05	0.95
Public Deal Premium	1.05	1.08	1.10	1.04	1.05	1.21
Private Deal Premium	1.10	1.03	1.15	0.99	1.10	1.15
Relation between P/NAV and Public Deal Premium	Negative		Positive		Zero	
Relation between P/NAV and Private Deal Premium	Positive		Positive		Zero	

Note: Appendix B presents hypothetical deals according to each of the three potential alternative hypotheses (NAV Anchoring, Bargaining Power, and NAV Irrelevance) discussed under Hypothesis 2. Each hypothesis is defined in the Hypothesis Development section of the article. For each hypothesis, there is a representative REIT trading at a premium to NAV and a discount to NAV. For each deal, there is a preannouncement stock price, a NAV, and a deal value, all on a per share basis.

Appendix C. Deal list

SNL Deal Key	Acquirer Name	Target Name	Date Announced
346406	Investor group	Monogram Residential Trust, Inc.	7/4/2017
319231	Government Properties Income Trust	First Potomac Realty Trust	6/28/2017
225139	Digital Realty Trust, Inc.	DuPont Fabros Tech0logy, Inc.	6/9/2017
222689	Sabra Health Care REIT, Inc.	Care Capital Properties, Inc.	5/7/2017
220445	Tricon Capital Group Inc.	Silver Bay Realty Trust Corp.	2/27/2017
217601	Regency Centers Corporation	Equity One, Inc.	11/14/2016
218738	Qatar Investment Authority	Empire State Realty Trust, Inc.	8/23/2016
215302	Mid-America Apartment Communities, Inc.	Post Properties, Inc.	8/15/2016
213092	NorthStar Asset Management Group Inc.	NorthStar Realty Finance Corp.	6/3/2016
211942	Cousins Properties Incorporated	Parkway Properties, Inc.	4/29/2016
210182	Brookfield Asset Management Inc.	Rouse Properties, Inc.	2/25/2016
207819	DRA Advisors LLC	Inland Real Estate Corporation	12/14/2015
207561	American Homes 4 Rent	American Residential Properties, Inc.	12/3/2015
206374	Harrison Street Real Estate Capital, LLC	Campus Crest Communities, Inc.	10/16/2015
206116	Blackstone Group L.P.	BioMed Realty Trust, Inc.	10/8/2015
205340	Blackstone Group L.P.	Strategic Hotels & Resorts, Inc.	9/8/2015
203315	Lone Star Investment Advisors, LLC	Home Properties, Inc.	6/22/2015
202028	Independence Realty Trust, Inc	Trade Street Residential, Inc.	5/11/2015
201576	Brookfield Asset Management Inc.	Associated Estates Realty Corporation	4/22/2015
196951	Washington Prime Group Inc.	Glimcher Realty Trust	9/16/2014
191550	Essex Property Trust, Inc.	BRE Properties, Inc.	12/19/2013
187244	Mid-America Apartment Communities, Inc.	Colonial Properties Trust	6/3/2013
171224	American Realty Capital Properties, Inc.	CapLease, Inc.	5/28/2013
170622	Brookfield Office Properties Inc.	MPG Office Trust, Inc.	4/25/2013
156886	Ventas, Inc.	Nationwide Health Properties, Inc.	2/28/2011
143208	Green Courte Partners, LLC	American Land Lease, Inc.	12/10/2008
138371	American Campus Communities, Inc.	GMH Communities Trust	2/12/2008
136749	Gramercy Capital Corporation	American Financial Realty Trust	11/5/2007
134362	Liberty Property Trust	Republic Property Trust	7/23/2007
133072	Goldman Sachs Group, Inc.	Equity Inns, Inc.	6/20/2007
132512	Morgan Stanley	Crescent Real Estate Equities Company	5/22/2007
132103	AP AIMCAP Holdings LLC	Eagle Hospitality Properties Trust, Inc.	4/27/2007
131994	J.E. Robert Company, Inc.	Highland Hospitality Corporation	4/24/2007
131877	Apollo Investment Corporation	Innkeepers USA Trust	4/15/2007
131719	Inland American Real Estate Trust, Inc.	Winston Hotels, Inc.	4/2/2007
130955	Centro Properties Group	New Plan Excel Realty Trust, Inc.	2/27/2007
127964	Blackstone Group, LP	Equity Office Properties Trust	11/19/2006
127872	JPMorgan Chase & Co.	Columbia Equity Trust, Inc.	11/5/2006
127765	General Electric Company	Trustreet Properties, Inc.	10/30/2006
127728	Allco Finance Group Limited	Government Properties Trust, Inc.	10/23/2006
127449	GEO Group, Inc.	CentraCore Properties Trust	9/19/2006
127395	Health Care REIT, Inc.	Windrose Medical Properties Trust	9/12/2006
127146	Morguard Corporation	Sizeler Property Investors, Inc.	8/21/2006
127223	Morgan Stanley	Glenborough Realty Trust Incorporated	8/20/2006
127117	SL Green Realty Corp.	Reckson Associates Realty Corporation	8/3/2006
127033	Lexington Corporate Properties Trust	Newkirk Realty Trust, Inc.	7/23/2006
126935	Kimco Realty Corporation	Pan Pacific Retail Properties, Inc.	7/9/2006
126934	Centro Watt	Heritage Property Investment Trust, Inc.	7/9/2006
126746	JV b	t Brookfield & Blackstone	6/5/2006
126675	Braveheart Holdings LP	Boykin Lodging Company	5/19/2006
126073	Public Storage, Inc.	Shurgard Storage Centers, Inc.	3/6/2006
126057	Blackstone Group L.P.	CarrAmerica Realty Corporation	3/5/2006
125955	Blackstone Group L.P.	MeriStar Hospitality Corporation	2/20/2006
125904	LBA Realty, LLC	Bedford Property Investors, Inc.	2/10/2006
125430	General Electric Company	Arden Realty Inc.	12/21/2005
125410	JV of Morgan Stanley and Onex	Town and Country Trust	12/19/2005
125327	CalEast Industrial Investors LLC	CenterPoint Properties Trust	12/7/2005
124932	Morgan Stanley	AMLI Residential Properties Trust	10/23/2005
124779	Brandywine Realty Trust	Prentiss Properties Trust	10/3/2005

(*continued*)

Continued.

SNL Deal Key	Acquirer Name	Target Name	Date Announced
124593	DRA Advisors, LLC	Capital Automotive REIT	9/2/2005
124057	DRA Advisors, LLC	CRT Properties, Inc.	6/17/2005
124069	ING Groep NV	Gables Residential Trust	6/7/2005
123872	ProLogis	Catellus Development Corporation	6/5/2005
123182	Centro Properties Group	Watt Family Properties Inc.	12/18/2004
123246	Camden Property Trust	Summit Properties Inc.	10/4/2004
123315	PL Retail LLC	Price Legacy Corporation	8/24/2004
123269	Simon Property Group, Inc.	Chelsea Property Group, Inc.	6/20/2004
123393	Eaton Vance-ProLogis Partnership	Keystone Property Trust	5/3/2004
123413	Transwestern Investment Company LLC	Great Lakes REIT	1/21/2004
123423	Kimco Realty Corporation	Mid-Atlantic Realty Trust	6/18/2003
123419	Hometown America, LLC	Chateau Communities, Inc.	5/29/2003
118992	Pennsylvania Real Estate Investment Trust	Crown American Realty Trust	5/13/2003
123437	CNL Hospitality Properties, Inc.	RFS Hotel Investors, Inc.	5/8/2003
123438	Equity One, Inc.	IRT Property Company	10/28/2002
120179	Developers Diversified Realty Corporation	JDN Realty Corporation	10/4/2002
123480	General Growth Properties, Inc.	JP Realty, Inc.	3/3/2002
123478	Security Capital Group, Inc.	Storage USA, Inc.	12/5/2001
123489	CalWest Industrial Properties, LLC	Cabot Industrial Trust	10/28/2001
123504	Archstone Communities Trust	Charles E. Smith Residential Realty, Inc.	5/3/2001