Further on the Returns to Non-Traded REITs

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I. Non-Traded REITs

We previously reported on the cumulative returns to 89 non-traded REITs.[3] These 89 REITs were all non-traded REITs that had merged into or had been acquired by a traded REIT (23), listed on an exchange and thus became a traded REIT (20), had been taken private or became bankrupt (2) or continued to operate as a nontraded REIT but had updated their net asset value (44) as of May 1, 2015.

We found that investors were at least $44 billion worse off as a result of investing in the 89 non-traded REITs compared to investing in a diversified portfolio of traded REITs as of May 1, 2015. Investors in the 45 non-traded REITs which became traded REITs or were cashed out suffered $24.5 billion in underperformance. Investors in the 44 non-traded REITs that were still non-traded but had updated their NAVs suffered at least $19.5 billion in underperformance. The actual underperformance for these 44 nontraded REITs was much greater because, unlike traded REITs, non-traded REITs offer virtually no secondary market liquidity and our reported calculations used the REITs' published NAVs, not their much lower sparsely reported transaction prices.

More than half of the non-traded REITs' underperformance we documented resulted from $15 billion in upfront fees charged to investors in the offerings - fees which largely fund sales commissions to brokers. This $15 billion in upfront fees would have grown to approximately $25 billion by the time the traded REITs became traded or last updated their NAVs prior to May 1, 2015. The rest of the non-traded REITs' underperformance results from conflicts of interest which permeate the organizational

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structure of non-traded REITs and which are largely absent in traded REITs. In this paper, we include 51 nontraded REITs that came into existence after May 1, 2015 and either had had a liquidity event or updated their NAVs between May 1, 2015 and December 31, 2019.

Returns to nontraded REITs continue to fall substantially short of the returns to traded REITs. For all 140 nontraded REITs, the shortfall relative to traded REITs is at least $59.2 billion. This systematic underperformance is observed for the additional nontraded REITs launched since May 1, 2015 as well as for the nontraded REITs in existence on May 1, 2015. We also document nontraded REITs' returns were lower than traded REIT returns for capital raised by nontraded REITs in *every* calendar quarter.

II. Sample Description and Research Design

a. Sample Description

Using SEC filings, we identified 147 SEC registrants between January 2000 and November 2019 that meet the following criteria:

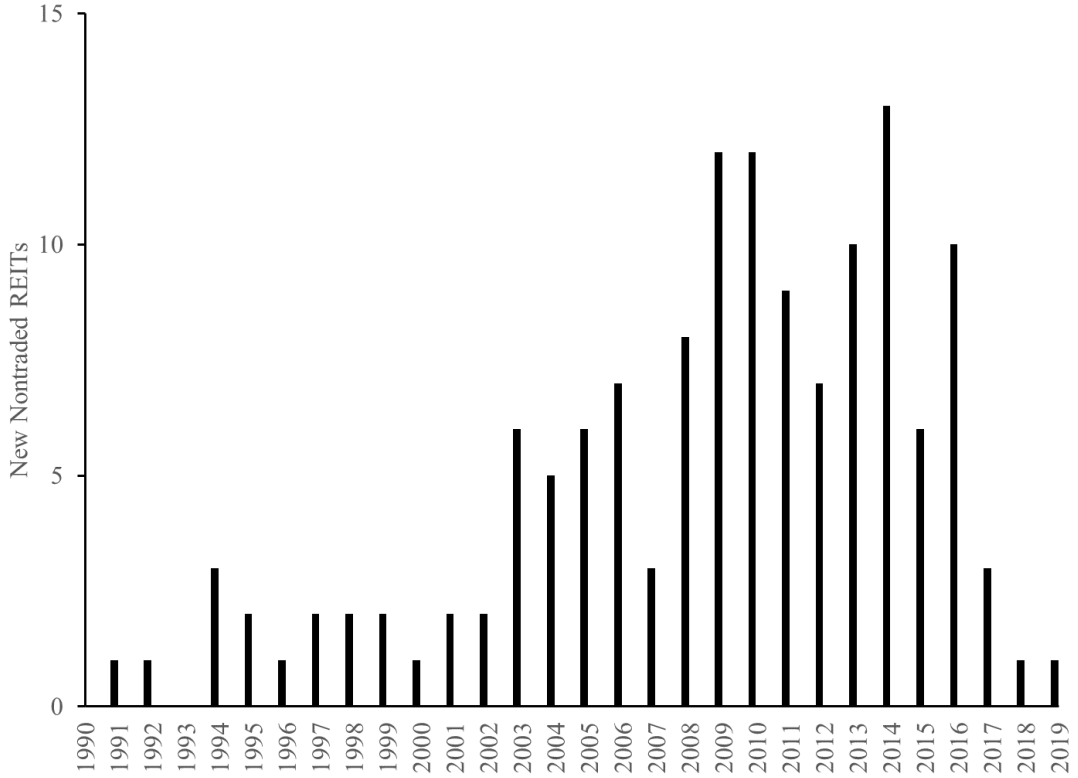
1. The SEC registrant files annual, audited financial statements with the SEC;
2. The SEC registrant elected to be taxed as a real estate investment trust (REIT);
3. The SEC registrant has always qualified to be a REIT since making the election;
4. Since electing to be taxed as a REIT, the SEC registrant has raised equity capital from unaffiliated investors through a public offering while the registrant was not listed on a national exchange; and
5. At least 1% of the SEC registrant's common shares outstanding are held by unaffiliated investors.

We exclude seven of the 147 non-traded REITs from our sample because they do not have enough information in their SEC filings for us to calculate a holding period return.[4] The remaining 140 non-traded REITs include all 89 non-traded REITs that had

[4] Five of the seven REITs we exclude had their registration revoked by the SEC, de-registered of their own volition, or simply stopped filing with the SEC. One REIT is operating, but has not yet published an updated NAV. The seventh REIT has insufficient information in its financial statements.

terminated or updated their NAVs by May 1, 2015 plus 51 additional non-traded REITs. The earliest non-traded REIT in our sample began raising capital in 1990, and the most recent non-traded REIT began raising capital in 2019. See Figure 1.

Figure 1 Year of Non-Traded REITs' First Public Capital Raising



Unlike traded REITs, which raise capital in discrete events, non-traded REITs keep equity offerings continuously open for several years. Non-traded REITs raise equity capital by offering shares to new investors and by offering shares to existing investors through distribution reinvestment programs. Figure 2 reports the number of non-traded REITs raising capital each year from 1990 to 2019. Because most non-traded REITs continue to raise equity through distribution reinvestments after they have stopped offering shares to new investors, Figure 2 presents two series: the number of non-traded REITs raising capital from new investors, and the number of non-traded REITs raising capital through distribution reinvestments.

Figure 2 Number of Non-Traded REITs Raising Capital, 1990-2019

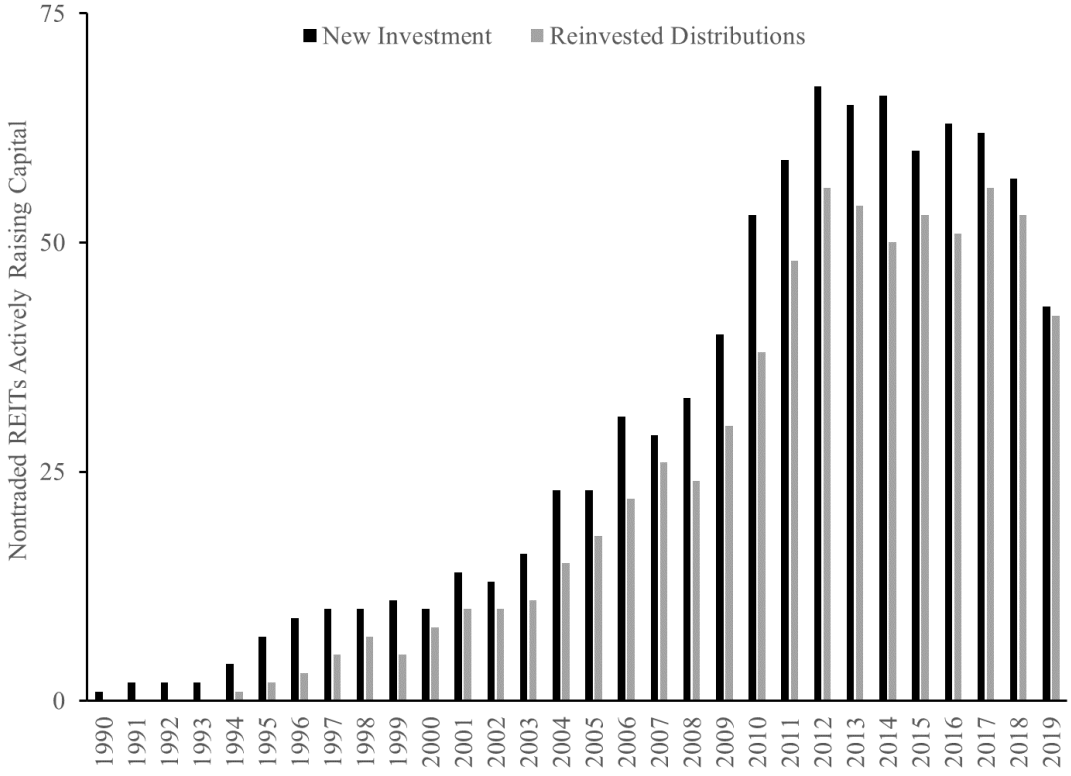
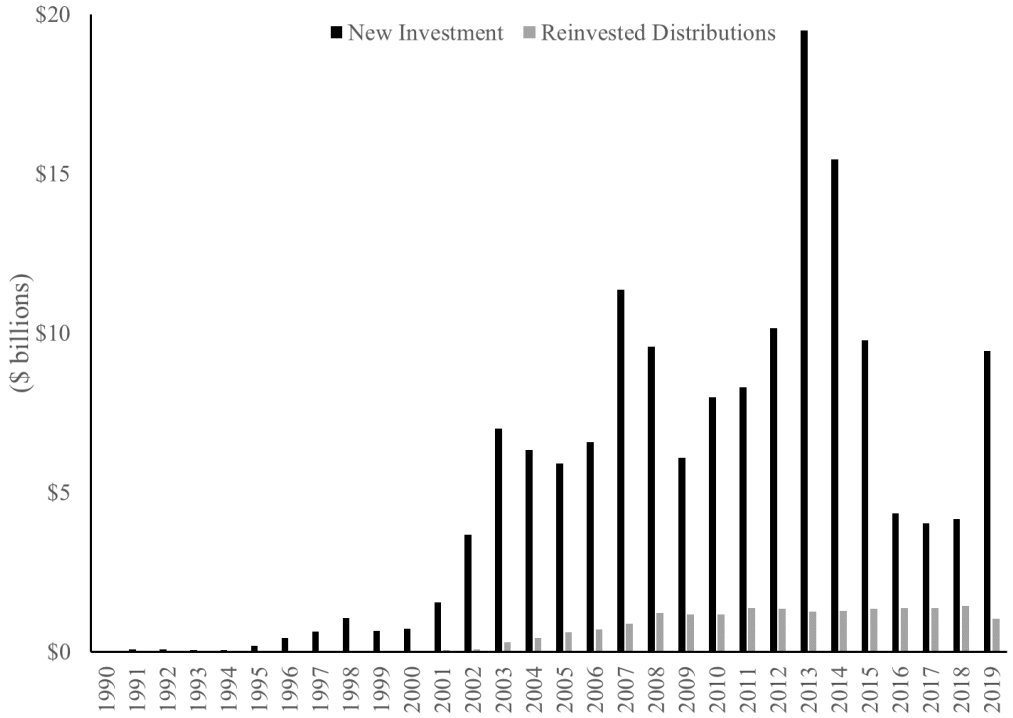


Figure 3 reports the dollar value raised by non-traded REITs each year. As of December 31, 2019, the 140 non-traded REITs had raised $173.6 billion of equity capital from unaffiliated investors through public offerings. The capital was raised from new investments ($155.1 billion) and reinvested distributions ($18.5 billion). Figure 3 shows that non-traded REITs have raised more than $4.0 billion in new investments every year since 2003, peaking at $19.5 billion in 2013.

Figure 3 Capital Raised by Year, 1990-2019



The dollar value of distributions reinvested each year is relatively constant at approximately $1.3 billion, even though the number of REITs raising capital through distribution reinvestments doubles and new capital investment increases as the mean distribution reinvestment rate fell from 42.2% to 30.6% from 2008 to 2019. The dollar value raised by non-traded REITs dropped sharply after 2013, despite many REITs continuing to actively raise capital (*see* Figure 2). The increased capital raising in 2019 is due entirely to Blackstone Real Estate Income Trust which raised $7.3 billion in 2019.

FINRA Regulatory Notice 15-02 requires nontraded REITs to update their NAVs no later than two years and 150 days after a nontraded REIT breaks escrow. On average, non-traded REITs raise 76.2% of their capital within three years after breaking escrow but the percentage of capital raised in the first three years (i.e., the period when the NAV does not have to be updated) increased from 68% to 91% after the FINRA requirement became effective.[5]

[5] FINRA Regulatory Notice 15-02 took effect on April 11, 2016.

Seventy-six non-traded REITs had ceased operating as non-traded REITs by December 31, 2019: 34 non-traded REITs had been acquired for cash or shares of a publicly listed company, 29 non-traded REITs had listed on an exchange, 11 non-traded REITs had chosen to liquidate their assets, one REIT had declared bankruptcy, and one REIT had been taken private. We refer to these events as "terminations," because the entities are no longer non-traded REITs. The remaining 64 non-traded REITs were still non-traded REITs as of December 31, 2019.[6] For the 76 non-traded REITs that had ceased operating as non-traded REITs, the time from initial offering to termination ranged from 1.6 years to 14.1 years and averaged 7.5 years. See Table 1.

Table 1 Non-Traded REIT Terminations

		Years from Initial Public Offering to Event		
Event	**Count**	**Min**	**Mean**	**Max**
Acquired (Consideration: Cash or Listed Stock)	34	1.6	7.2	13.5
Listed on a National Exchange	29	2.2	7.0	13.0
Liquidated	11	4.5	9.9	14.1
Taken Private/Bankrupt	2	6.7	6.7	6.8
Total	**76**	**1.6**	**7.5**	**14.1**

The 76 terminated non-traded REITs all have observable exit prices or terminal cash flows, which makes it relatively straight-forward to calculate investor returns. The 64 operating non-traded REITs, however, do not have liquid secondary markets with observable share prices. Instead, we use transaction prices reported from illiquid secondary markets and self-reported NAV to calculate investor returns for the 64 operating non-traded REITs.

Non-traded REIT shares are traded intermittently through third party intermediaries.[7] Summarized information about transactions is published every two months

[6] Six of the 64 non-traded REITs had been acquired by another non-traded REIT in a stock-for-stock transaction. We do not consider those acquisitions to be terminations because investors are still invested in a non-traded REIT and have not been allowed to liquidate their entire investment.

[7] According to CTT Auctions—one of the secondary market groups that provides intermediation services—a seller tells the secondary market group which REIT she wants to sell, how many shares she wants to sell, how long the auction should remain open, and what the seller's minimum required price is (the "reserve price"). Sellers may choose any duration and price, though CTT Auctions offers guidance on both. The secondary market group then opens the auction to the public. The secondary market groups do not match buyers and sellers. If the shares are sold, CTT Auctions charges the seller $295 or 5% of the sales amount, whichever is larger.

by Direct Investment Spectrum. Direct Investment Spectrum reports at least one secondary market transaction between June 1, 2018 and January 31, 2020 for 44 of the 64 operating non-traded REITs. Between June 1, 2018 and January 31, 2020, those 44 REITs had a total of 2,883 trades, with aggregate trading volume of 17.4 million shares ($68.2 million). Putting the reported trading in perspective, the 44 nontraded REITs had 4.5 billion shares outstanding in December 2019. The reported trading volume over the entire 20 months (17.4 million shares) is only 0.4% of shares outstanding. We use the most recent transaction prices from Direct Investment Spectrum to calculate investor returns for the 44 operating non-traded REITs that have trading activity between June 1, 2018 and January 31, 2020.

NAV can help investors assess investment performance, but NAV and share price are not the same. Existing research has documented that listed REITs trade above or below their NAV (Benveniste et al [2001], Clayton and MacKinnon [2000, 2002]), and that the premium or discount varies across time, REIT size, and leverage (Clayton and MacKinnon, 2000), the relative liquidity of private real estate ((Clayton and MacKinnon, 2002), and short sale activity (Brounen et al., 2013).

On average, the transaction prices reported by Direct Investment Spectrum from December 2011 through January 2020 were 23.0% lower than the REITs' contemporaneous self-reported NAV (mean=23.0%, median=21.2%). Between June 2018 and January 2020, the transaction prices of the operating non-traded REITs in our sample were 24.6% lower on average than their contemporaneous NAV.

For the 20 operating non-traded REITs without any reported trading activity between June 2018 and January 2020, we estimate the secondary market price by applying the average NAV-to-transaction price discount (24.6%) to each REIT's most recent NAV. For comparison, we also report our results using the actual self-reported NAV for all 64 operating non-traded REITs.

Alternatively, we could exclude operating non-traded REITs from our sample. However, doing so could introduce bias into our sample selection by looking at only non-traded REITs that have chosen to stop operating as a non-traded REIT.[8]

b. Research Design

We calculate the investment return of each non-traded REIT over a holding period starting with each REIT's initial non-listed public offering and ending when the REIT ceases to be a non-traded REIT. For the 64 REITs that are still non-traded REITs as of December 31, 2019, we end the holding period on the date closest to December 31, 2019 on which the REIT had an observable transaction price or provided an updated NAV.[9] We construct a full history of the timing and magnitude of unaffiliated investors' cash flows for each non-traded REIT from information in the financial statements contained in the REIT's Form 10-K, 10-Q, and 424(b) filings.[10] Cash flows from investors to the REITs consist of all share purchases and re-invested distributions. Cash flows from the REITs to the investors include the portion of distributions not re-invested through distribution reinvestment plans, plus the amount investors receive from selling shares back to the REITs through share redemption plans.

To determine the value of the investment at the end of the holding period, we assume all investors sell their shares on the first date they are able to do so through an acquisition, exchange listing, or going-private transaction. For REITs that are still non-traded, we assume the shares are worth the most recent, successful secondary market

[8] The selection bias stems from the fact that non-traded REITs generally choose when to stop operating as a non-traded REIT.

[9] The holding periods for the 64 REITs end between September 30, 2018 and January 31, 2020. The holding periods of 44 REITs conclude with secondary market auctions, which were reported between September 30, 2018 and January 31, 2020. The holding periods of the remaining 20 REITs conclude with NAV updates, which were between December 31, 2018 and December 31, 2019. All 64 operating non-traded REITs updated their NAV at least once between June 30, 2018 and January 8, 2020. We use the NAV valuation date rather than effective date. For example, if a REIT announced on March 12, 2020 that its NAV was $12 as of December 31, 2019, we would use December 31, 2019 as the NAV date.

[10] Some non-traded REITs have more than one share class, with each share class having a different fee structure. However, the financial statements do not provide enough information to allow us to allocate cash flows among the share classes. We therefore aggregate the cash flows across all share classes within each non-traded REIT.

transaction price or the most recent self-reported NAV, less the average NAV-to-transaction price discount.

We compare the wealth investors accumulated in non-traded REITs to the wealth they would have accumulated had they instead invested the same stream of cash flows in a low-cost, passive mutual fund of traded REITs. We use the Vanguard REIT Index Fund (VGSIX) as our representative benchmark.[11] This investable and passive benchmark is preferable to an appraisal-based benchmark for three reasons. First, an appraisal-based index is un-investable, making it impossible to construct a true opportunity cost that corresponds to the timing of investments in non-traded REITs. Second, the returns to the Vanguard REIT Index Fund reflect actual investment performance after accounting for all fees and transactions costs. Third, appraisal-based indexes are known to incorporate value-relevant information with a lag compared to the prices of traded REITs (Giliberto [1993] and Gyourko and Keim [1992]).

III. Empirical Analysis

In this section, we provide returns-based evidence that non-traded REITs continue to dramatically underperform investments in the traded REIT benchmark. We also show that the estimated NAV provided by non-traded REITs are not correlated with traded REIT pricing.

Table 2 summarizes the wealth accumulated by unaffiliated investors in the 140 non-traded REITs, and the wealth they would have accumulated by making an equivalent investment in the traded REIT benchmark (VGSIX). Panel A presents the results from valuing operating non-traded REITs at their most recent transaction price or their NAV, adjusted for the average NAV-to-transaction price discount. Panel B presents the results from valuing all operating non-traded RIETs at their unadjusted NAV. In Panel A, the

[11] The Vanguard REIT Index Fund is a passive, low-fee mutual fund which "seeks to track the investment performance of the MSCI US Investable Market Real Estate 25/50 Index" (https://investor.vanguard.com/mutual-funds/profile/portfolio/vgsix, accessed on June 1, 2020) by investing in a diversified portfolio of traded REITs. We use the returns to the Vanguard REIT Index Fund's investor-class shares (VGSIX).

non-traded REITs accumulated an aggregate $111.3 billion, $75.7 billion (40.5%) less than the $187.0 billion accumulated by the equivalent investment in the traded REIT benchmark. If operating non-traded REITs are valued at their self-reported NAV rather than transaction prices (see Panel B), the shortfall is $59.2 billion. Comparing Panel A and Panel B reveals that $16.5 billion (45.2%) of the $36.5 billion shortfall from operating non-traded REITs is attributable to the difference between self-reported NAV and prices at which investors actually trade shares.

Forty-five of the 76 terminations in Table 2 were prior to May 1, 2015. The next sub-section focuses on investment returns from the 31 new terminations and 64 operating non-traded REITs. The subsequent sub-section examines the cross-sectional differences in the investment returns of all 140 non-traded REITs.

Table 2 Comparison of Non-Traded and Traded REIT Accumulated Wealth ($ billions)

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

Event	Number	Non-Traded REITs	Traded REIT Benchmark	Shortfall
Terminations Before May 1, 2015	45	$55.2	$79.2	$24.0
Terminations After May 1, 2015	31	$14.7	$29.8	$15.1
Operating Non-Traded REITs	64	$41.4	$78.0	$36.6
Total	**140**	**$111.3**	**$187.0**	**$75.7**

Panel B Operating non-traded REITs are valued at unadjusted NAV

Event	Number	Non-Traded REITs	Traded REIT Benchmark	Shortfall
Terminations Before May 1, 2015	45	$55.2	$79.2	$24.0
Terminations After May 1, 2015	31	$14.7	$29.8	$15.1
Operating Non-Traded REITs	64	$56.5	$76.6	$20.1
Total	**140**	**$126.4**	**$185.6**	**$59.2**

a. Analysis of New Investment Returns

Table 3 compares (1) the accumulated wealth in the 95 non-traded REITs that terminated after May 1, 2105 or that continue to operate as non-traded REITs and (2) the alternative wealth that would have been accumulated if the same streams of cash flows had been invested in the traded REIT benchmark. If operating non-traded REITs are valued

using transaction prices or adjusted NAV, the cumulative wealth shortfall for the 95 non-traded REITs is $51.7 billion (see Panel A). Non-traded REIT investors would have had 92.0% more wealth if they had invested in the traded REIT benchmark instead of the non-traded REITs. The $51.7 billion shortfall understates the true difference in performance because it counts a $1 shortfall measured in 2015 the same as a $1 shortfall measured in 2019. Bringing forward each non-traded REITs shortfall to December 31, 2019 at the returns to Vanguard's Short-Term Treasury Fund makes the shortfall $52.4 billion as of December 31, 2019. Bringing forward each shortfall at the returns to the traded REIT benchmark makes the shortfall $56.2 billion as of December 31, 2019.

If operating non-traded REITs are valued at their self-reported NAV rather than transaction prices, the shortfall is $35.2 billion (see Panel B).

Table 3 Comparison of Non-Traded and Traded REIT Accumulated Wealth ($ billions)

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

Event	Number	Non-Traded REITs	Traded REIT Benchmark	Shortfall
Terminated Non-Traded REITs	**31**	**$14.7**	**$29.8**	**$15.1**
Liquidated	11	$0.0	$7.1	$7.1
Listed on a National Exchange	8	$4.4	$10.2	$5.8
Acquired for Cash or Listed Shares	12	$10.3	$12.6	$2.3
Operating Non-Traded REITs	**64**	**$41.4**	**$78.0**	**$36.5**
Total	**95**	**$56.2**	**$107.8**	**$51.7**
At 12/31/2019, with Short-term Treasury Returns				**$52.4**
At 12/31/2019, with Traded REIT Returns				**$56.2**

Panel B Operating non-traded REITs are valued at unadjusted NAV

Event	Number	Non-Traded REITs	Traded REIT Benchmark	Shortfall
Terminated Non-Traded REITs	**31**	**$14.7**	**$29.8**	**$15.1**
Liquidated	11	$0.0	$7.1	$7.1
Listed on a National Exchange	8	$4.4	$10.2	$5.8
Acquired for Cash or Listed Shares	12	$10.3	$12.6	$2.3
Operating Non-Traded REITs	**64**	**$56.5**	**$76.6**	**$20.1**
Total	**95**	**$71.2**	**$106.4**	**$35.2**
At 12/31/2019, with Short-term Treasury Returns				**$36.2**
At 12/31/2019, with Traded REIT Returns				**$40.7**

The $51.7 billion wealth loss in Table 3 results from non-traded REIT investors bearing similar real estate risk but earning much lower returns than traded REIT investors. An alternative perspective on these risk-adjusted returns is to note that US Treasury securities have earned better returns than non-traded REITs, but at much lower risk. Investors contributed $106.1 billion to the 95 non-traded REITs, received $49.7 billion in distributions, and had shares worth $56.2 billion when the REITs ceased operating as non-traded REITs or at the time of the REITs' most recent reported secondary market transaction price or most recent NAV update. The non-traded REIT investors thus had a net loss of $0.2 billion.[12] The same net investments would have had a net gain of $7.8 billion in Vanguard's Short-Term Treasury Fund (VFISX), $17.0 billion in Vanguard's Intermediate-Term Treasury Fund (VFITX), $37.4 billion in Vanguard's Long-Term Treasury Fund (VUSTX) and $51.4 billion in Vanguard's REIT Index Fund (VGSIX). See Figure 4, Panel A.

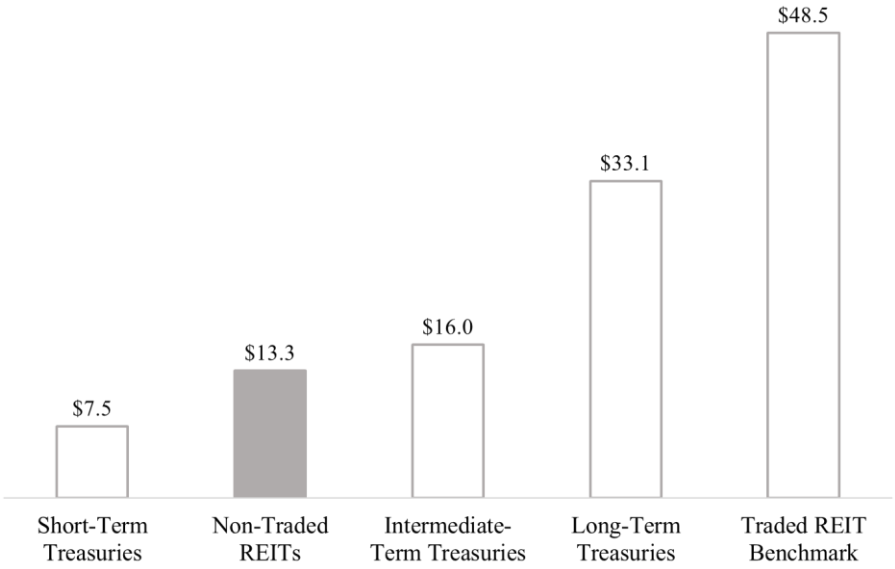
If operating non-traded REITs are valued at their self-reported NAV rather than auction prices, the $0.2 billion net loss changes to a $13.3 billion net gain. See Figure 4, Panel B. Although the net gain from investing in non-traded REITs is much higher if REITs are valued at their self-reported NAV, the gains are still less than would have been earned from an investment in intermediate U.S. Treasury securities and only 1/4th of the gains which would have accrued on the same amounts invested in traded REITs.

[12] $56.2 billion + $49.7 billion – $106.1 billion = -$0.2 billion.

Figure 4 Net Out-of-Pocket Gains ($ billions) from Equivalent Investments (n=95 REITs)

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

Panel B Operating non-traded REITs are valued at unadjusted NAV



We compare returns across non-traded REITs by calculating each non-traded REIT's internal rate of return (IRR) by solving for the rate of return that equates the future value of net investor flows into the non-traded REITs with the liquidation amount, transaction price, or updated NAV. We use the same procedure to calculate the IRRs of equivalent investments in the traded REIT benchmark, but we replace the liquidation amount, transaction price, or updated NAV with the value of the equivalent investment at the end of the holding period. Since the non-traded REITs differ in size and number of years in existence, the IRR analysis augments the shortfall analysis by providing estimates of annual return differences between non-traded REITs and the traded REIT benchmark.

If operating non-traded REITs are valued at their transaction price or adjusted NAV, the average IRR for the non-traded REITs is -5.3%, compared to 8.4% for equivalent investments in the traded REIT benchmark. The difference in means is statistically significant ($t(94)=5.93$, $p<0.01$). The non-traded REIT IRRs range from –188.3% to 12.7%, with an interquartile range of 11.6% (-7.9% to 3.7%). A composite cash-flow stream, which aggregates the investment cash flows across all 95 non-traded REITs, has a -0.1% IRR. The same composite cash-flow stream invested in the traded REIT benchmark would have generated an IRR of 7.9%. In other words, investors in a liquid, diversified portfolio of traded REITs that exposes investors to the same underlying real estate market as the non-traded REITs received annual returns that are 8.0% per year higher than those earned in non-traded REITs. See Table 4.

Valuing operating non-traded REITs at their NAV increases the average IRR from -5.3% to 2.3% and the composite IRR from -0.1% to 2.7%.[13] However, the non-traded REIT IRRs are still statistically significantly lower than the IRRs of equivalent investments in the traded REIT benchmark ($t(94)=6.75$, $p<0.01$).

In addition, non-traded REITs that broke escrow after 2015 do not perform any better or worse than non-traded REITs that broke escrow in 2015 or earlier. The difference

[13] For comparison, the 45 non-traded REITs terminated by May 1, 2015 have a composite IRR of 6.2%, which is 6.5% less than the IRR of an equivalent investment in the traded REIT benchmark.

in means (the "IRR Shortfall") is not statistically different from the difference in means for the 45 non-traded REIT terminations prior to May 1, 2015 (t(137)=1.36, p=0.18).

Table 4 Distribution of 95 Non-Traded REITs Internal Rates of Return

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

	Non-Traded REITs	Traded REIT Benchmark
Minimum	-188.3%	-3.2%
25th Percentile	-7.9%	6.9%
Mean	**-5.3%**	**8.4%**
75th Percentile	3.7%	9.8%
Maximum	12.7%	15.4%
Aggregate Investment	**-0.1%**	**7.9%**

Panel B Operating non-traded REITs are valued at unadjusted NAV

	Non-Traded REITs	Traded REIT Benchmark
Minimum	-25.1%	-3.2%
25th Percentile	-0.4%	6.8%
Mean	**2.3%**	**8.2%**
75th Percentile	6.8%	9.8%
Maximum	21.0%	15.5%
Aggregate Investment	**2.7%**	**7.8%**

Unlike traded REITs, non-traded REITs offer virtually no secondary market liquidity until they cease operating as a non-traded REIT. Mean annualized share turnover (number of shares repurchased by the non-traded REIT / average number of shares outstanding) for unaffiliated investors increased from 0.0% in 1990 to 1.1% in 2015 and 2.9% in 2019. Median annualized share turnover increased from 0.0% in 1990 to 0.5% in 2015 and 1.2% in 2019. For comparison, the average annualized share turnover of constituents of the traded REIT benchmark increased from 62% in 1999 to 176% in 2015 and 176% in 2019.

Returns on non-traded REITs should be higher than returns on traded REITs to compensate investors for illiquidity (Amihud [2002] and Pastor and Stambaugh [2003]). Also, our benchmark contains over one hundred traded REITs and so is much less volatile than the average individual REIT. Thus, investors in diversified portfolios of traded REITs bear less liquidity and market risk and earn substantially higher returns than investors in non-traded REITs.

Table 5 summarizes the non-traded REIT IRRs based on if and how the REIT stopped operating as a non-traded REIT. On average, terminated non-traded REITs have a higher IRR and a smaller shortfall than operating non-traded REITs. However, the difference varies significantly across different types of termination events. Non-traded REITs that are acquired for cash or shares of a listed entity have statistically significantly higher IRRs than other terminated non-traded REITs ($t(29)=2.54$, $p=0.02$).[14] The difference is also statistically significant if shortfalls are compared rather than non-traded REIT IRRs ($t(29)=2.81$, $p=0.01$), indicating that the difference is not due to the general condition of the real estate market at the time of the termination events.[15] The superior performance of acquired non-traded REITs suggests that the best-performing non-traded REITs are merged into other REITs.[16]

We also find that IRRs of equivalent investments in the traded REIT benchmark are not statistically different across the four groups of events ($F(3,91)=0.52$, $p=0.67$) suggesting that the performance of the real estate market, as proxied for by the traded REIT benchmark, is not a significant factor in deciding if and how to terminate a non-traded REIT. [17]

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[14] We conduct a difference-of-means test on the non-traded REIT IRRs.
[15] We conduct a difference-of-means test on the differences between the IRRs of the non-traded REITs and the IRRs of the equivalent investments in the traded REIT benchmark.
[16] Alternatively, it is possible that non-traded REITs are acquired at a premium. An acquisition premium would cause the acquired non-traded REITs to have higher internal rates of return than other terminated REITs, even if the acquired REITs had similar internal rates of return before the acquisition.
[17] We conduct an ANOVA test on the IRRs of the equivalent investments in the traded REIT benchmark. The result is similar if operating non-traded REITs are valued at their self-reported NAV rather than auction prices ($F(3,91)=0.29$, $p=0.84$).

Valuing operating non-traded REITs at their NAV increases the average operating non-traded REIT IRR from -8.2% to 3.1% but does not change any of the statistical conclusions.

Table 5 Mean Internal Rates of Return, by Non-Traded REIT Operating Status

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

Event	Number	Non-Traded REITs	Traded REIT Benchmark
Terminated Non-Traded REITs	**31**	**0.5%**	**7.9%**
Acquired for Cash or Listed Shares	12	4.8%	7.5%
Liquidated	11	-0.6%	8.4%
Listed on a National Exchange	8	-4.3%	7.8%
Operating Non-Traded REITs	**64**	**-8.2%**	**8.6%**

Panel B Operating non-traded REITs are valued at unadjusted NAV

Event	Number	Non-Traded REITs	Traded REIT Benchmark
Terminated Non-Traded REITs	**31**	**0.5%**	**7.9%**
Acquired for Cash or Listed Shares	12	4.8%	7.5%
Liquidated	11	-0.6%	8.4%
Listed on a National Exchange	8	-4.3%	7.8%
Operating Non-Traded REITs	**64**	**3.1%**	**8.4%**

In summary, non-traded REITs significantly underperform the traded REIT benchmark. The underperformance varies by termination event, with non-traded REITs that were acquired for cash or listed shares having the smallest average underperformance. Overall, investors would have earned $51.7 billion (92.0%) more by investing in the traded REIT benchmark rather than the non-traded REITs. Finally, the 95 non-traded REITs discussed in this sub-section are comparable to the 45 non-traded REIT which terminated prior to May 1, 2015. The IRR shortfalls of the two groups are not statistically different from each other, and both groups have similar investor outcomes within termination events.

b. Analysis of All Investment Returns

We test whether the IRRs of 95 non-traded REITs that had not terminated by May 1, 2015 are from the same population as the 45 non-traded REITs that had terminated by

May 1, 2015 by running Wilcoxon rank sum test comparing the IRR shortfalls of the terminated non-traded REITs before 2015 (n=45) to the IRR shortfalls of the terminated non-traded REITs after 2015 (n=31). The two groups are not statistically different (z=-0.94, p=0.35).

We test whether the overall underperformance of non-traded REITs is driven by a short period of exceptionally poor performance, rather than consistent underperformance relative to the traded REIT benchmark by examining the returns to all 140 non-traded REITs by calendar year in which capital was raised.[18] We identify the capital that was raised by each non-traded REIT in each calendar year, and allocate all subsequent distributions and share repurchases to the capital raised in each calendar year. The resulting dataset contains 1,077 CIK-years, each with a unique stream of cash flows. We aggregate the cash flows across non-traded REITs by calendar year and calculate the IRR for each year, as well as the IRR of an equivalent investment in the traded REIT benchmark. The IRRs for the capital raised in each year, along with the IRRs of the equivalent investments in the traded REIT benchmark, are presented in Figure 5.

The traded REIT benchmark outperforms the non-traded REITs *in every year*. We conclude that the non-traded REITs' underperformance is not driven by a short period of extremely poor performance or by temporary market conditions that significantly disfavored nontraded REITs. In addition, Figure 5 suggests that although both non-traded and traded REITs were hurt by the residential and commercial real estate busts in 2007-2008, traded REITs were better able to take advantage of the low real estate prices at the bottom of the market.

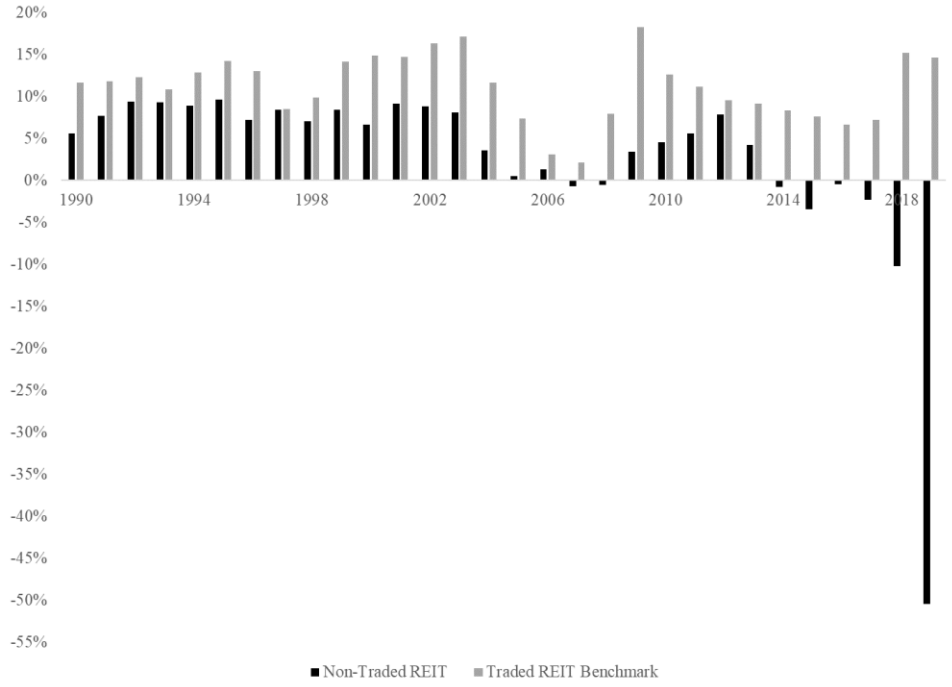
From 2014-2019, the non-traded REIT IRRs are negative. This is because investors purchase shares at the NAV or higher but can only sell the shares at a steep discount in secondary market auctions. Panel B repeats the analysis, but values the operating non-

[18] One terminated non-traded REIT, Desert Capital REIT, declared bankruptcy in 2011 and did not produce a meaningful IRR. We exclude it for the IRR analysis, reducing the sample size to 139.

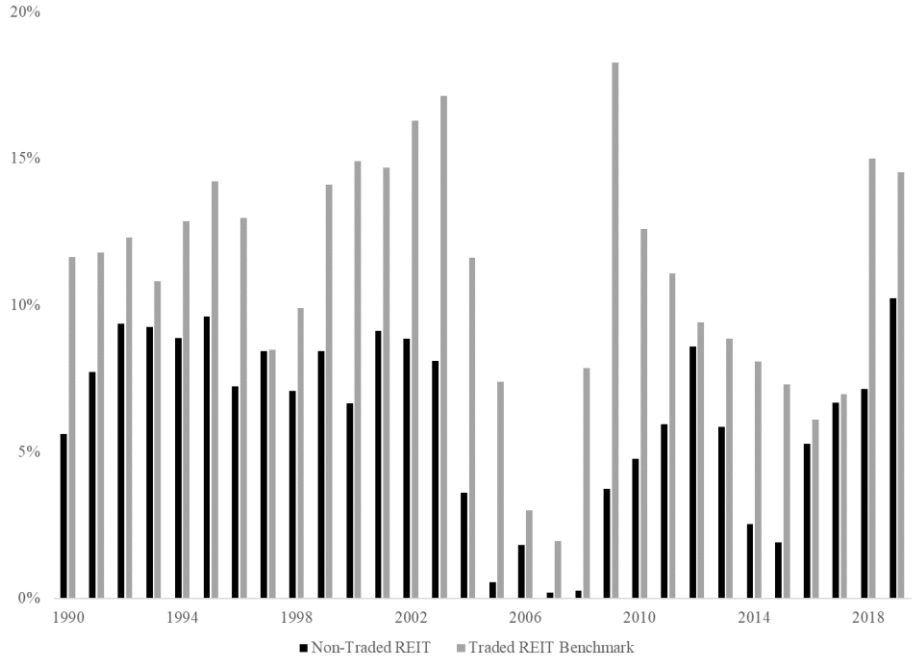
traded REITs at their NAV. This eliminates the negative IRRs, but non-traded REITs still consistently underperform the traded REIT benchmark.

Figure 5 IRRs by Year of Capital Raising

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount



Panel B Operating non-traded REITs are valued at unadjusted NAV



Because traded and non-traded REITs both invest in real estate, their IRRs should be correlated. That is, non-traded REITs should perform well when traded REITs do well, and non-traded REITs should perform poorly when traded REITs do poorly. To test this, we run a simple correlation between the IRRs of non-traded REITs and the IRRs of equivalent investments in the traded REIT benchmark. The IRRs of terminated non-traded REITs are plotted against the traded REIT benchmark IRRs in Figure 6. The IRRs of operating non-traded REITs are plotted against the traded REIT benchmark IRRs in Figure 7. In each figure, influential outliers (which we omit when calculating statistics) are identified with a dash instead of a dot. A visual inspection of Figures 6 and 7 suggests that the IRRs of terminated non-traded REITs are positively correlated with the IRRs of equivalent investments in the traded REIT benchmark, but the IRRs of operating non-traded REITs are not positively correlated with the IRRs of investments in the traded REIT benchmark.

Figure 6 IRRs of Terminated Non-Traded REITs (n=75)

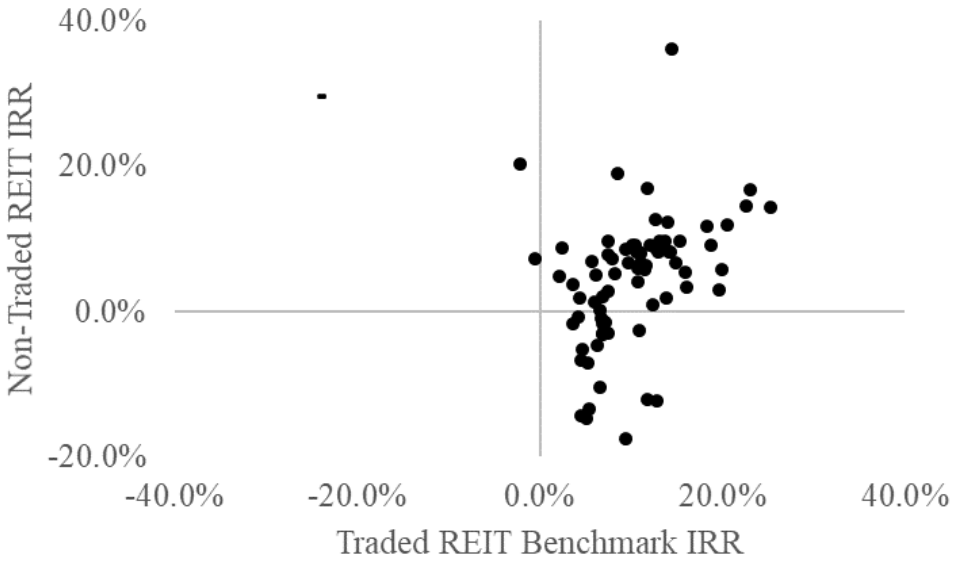
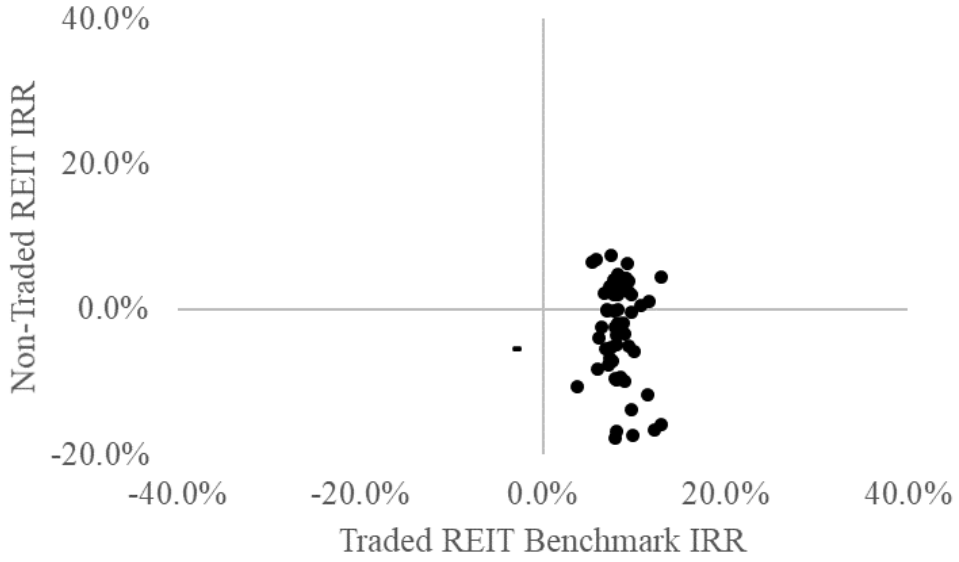
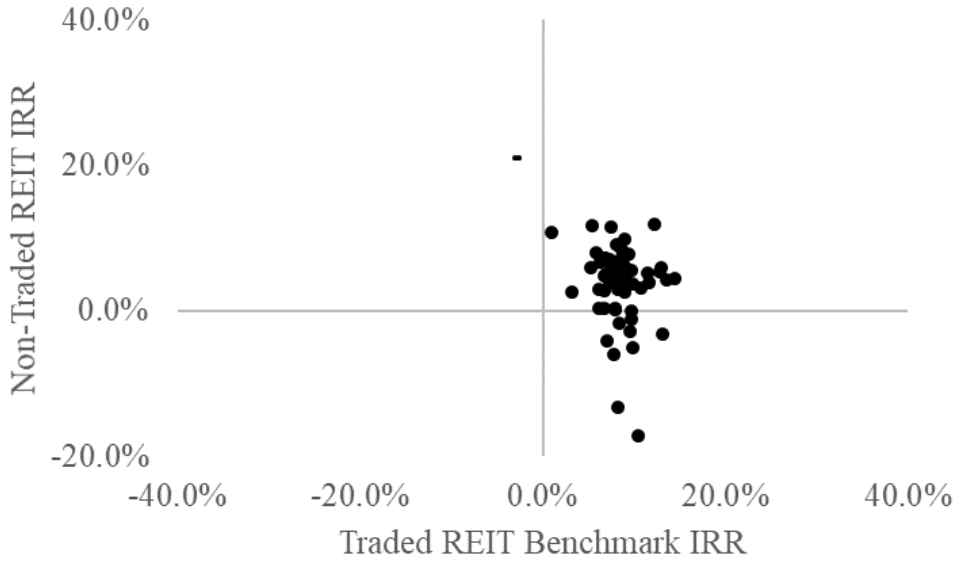


Figure 7 IRRs of Operating Non-Traded REITs (n=64)

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount



Panel B Operating non-traded REITs are valued at unadjusted NAV



As shown in Table 6, the IRRs of non-traded REITs which have been liquidated or listed on a national exchange are significantly positively correlated with the IRRs of equivalent investments in the traded REIT benchmark. The IRRs of non-traded REITs

which have been acquired for cash or listed shares are also positively correlated with the IRRs of equivalent investments in the traded REIT benchmark.

However, the IRRs of the remaining non-traded REITs (i.e., those which are still operating or have been acquired for stock by a non-traded REIT) are significantly *negatively* correlated with the IRRs of equivalent investments in the traded REIT benchmark. This is true regardless of how operating non-traded REITs are valued. One possible explanation for the negative correlation is that the updated NAV estimates provided by the non-traded REITs in our sample are not good reflections of fair market values.

Table 6 Correlation of Non-Traded REIT IRRs and Traded REIT Benchmark IRRs

Panel A Operating non-traded REITs are valued at auction price or NAV adjusted for average auction discount

Event [a]	Number of Observations	Correlation Coefficient	P-Value
Liquidated	11	0.67	0.02
Listed on a National Exchange	29	0.41	0.03
Acquired for Cash or Listed Shares	33	0.33	0.06
Operating Non-Traded REITs	63	-0.43	0.00

[a] Excludes "Taken Private" (n=1) and two outliers.

Panel B Operating non-traded REITs are valued at unadjusted NAV

Event [a]	Number of Observations	Correlation Coefficient	P-Value
Liquidated	11	0.67	0.02
Listed on a National Exchange	29	0.41	0.03
Acquired for Cash or Listed Shares	33	0.33	0.06
Operating Non-Traded REITs	63	-0.29	0.02

[a] Excludes "Taken Private" (n=1) and two outliers.

IV. Conclusions

We document significantly lower returns earned by investors in 140 non-traded REITs compared to the returns they would have earned in a portfolio of traded REITs. We estimate that non-traded REITs as a group underperform traded REITs by approximately 8% annually (5-6% annually, before taking into account the 24.6% discount to NAV

observed in non-traded REIT auctions). The dollar losses from investing in non-traded REITs instead of the traded REITs exceed $75 billion as of December 31, 2019. The underperformance has not decreased over time; non-traded REITs that broke escrow in the last four years underperform the traded REIT benchmark to the same degree as earlier non-traded REITs. We show that the non-traded REITs' underperformance is not driven by a short period of extremely poor performance but is instead common across time.

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