

Non-Traditional Property Types: *Part of a Diversified Real Estate Portfolio?*

WILL MCINTOSH, MARK FITZGERALD, AND JOHN KIRK

WILL MCINTOSH

is global head of research at USAA Real Estate Company in San Antonio, TX.

will.mcintosh@usrealco.com

MARK FITZGERALD

is a senior director of research at USAA Real Estate Company in San Antonio, TX.

mark.fitzgerald@usrealco.com

JOHN KIRK

is a senior associate in research at USAA Real Estate Company in San Antonio, TX.

john.kirk@usrealco.com

Institutional investors are increasingly allocating capital to property sectors that fall outside the traditional focus of multifamily, office, retail, industrial, and hotel. These non-traditional sectors include self-storage, healthcare, medical office, student housing, manufactured housing, and other niche sectors.¹ The literature and research on these non-traditional sectors is limited because of their recent emergence and a general paucity of data collection relative to the major sectors. The systematized capture of performance data for these non-traditional sectors is beginning to improve, and this article attempts to provide a brief review of the data and literature that do exist, give an overview of the non-traditional sectors that have become popular with private market investors, and take a small step forward in examining the data that are available.

INVESTOR DEMAND FOR ALTERNATIVE ASSET CLASSES

Increased demand for alternative investments, real estate in particular, has caused the sector to see increased capital flows from domestic and foreign investors. For example, total pension assets held by the top seven countries globally (the *P7*)² total \$32.9 trillion as of 2015.³ From 1995 to 2015, the allocation of these pension funds

to real estate and other alternative asset classes increased from 5% to 24% (Willis Towers Watson [2015, 2016]). For U.S. pension plans, the allocation to alternatives was even higher at 27% in 2015. In fact, since 2005, over 40% of the growth in U.S. pension fund assets has come from real estate and other alternatives (Willis Towers Watson [2016]). Part of the reason for the shift is derived from the fact that alternatives have offered higher yields in a low-interest-rate environment. Regulatory burdens on large financial institutions have also caused many talented financial professionals to focus on the private markets and alternatives in particular.

The U.S. commercial real estate market is the third-largest asset class in the United States, estimated to have a market capitalization close to \$23 trillion.⁴ The market is 57% of the size of the U.S. fixed income market (\$39.7 trillion) and 63% of the size of U.S. corporate equities (\$35.7 trillion).⁵

Strategic allocations to real estate should continue to grow for the foreseeable future. Commercial real estate transaction volume in 2015 was \$534 billion, the second largest year on record after 2007, with 2016 volume just under \$500 billion. Increased activity is being driven by both domestic and foreign investors interested in U.S. real estate; direct foreign acquisitions of U.S. commercial property totaled \$95.3 billion in 2015, nearly double the previous record of \$48.4 billion

in 2007, and topped \$70 billion in 2016.⁶ Investors remained committed to real estate even during the Great Recession (Clayton et al. [2015]). In the private markets, the value of properties held by funds in the NFI-ODCE⁷ benchmark totals \$220 billion, nearly double the pre-recession high of \$104 billion in 2007. In the public sector, market capitalization of public real estate investment trusts (REITs) has more than doubled pre-recession levels as well and topped \$1 trillion for the first time in 2016. Strong demand is pushing real estate investors and managers into non-traditional and emerging property sectors, as they look to increase the size of their portfolio and enhance yields. The role of real estate in a multiasset portfolio continues to gain acceptance (Clayton et al. [2013]).

RISING PROMINENCE OF NON-TRADITIONAL PROPERTY SECTORS

Elevated demand for real assets has caused allocations to non-traditional property types⁸ by institutional investors to increase as well. For publicly traded equity REITs, equity market capitalization crossed \$1 trillion in 2016, of which nearly 40% is in REITs that focus on non-traditional property types (see Exhibit 1), according to data from the National Association of Real Estate Investment Trusts (NAREIT).⁹ This is a similar percentage as indicated by the estimated size of the overall market capitalization of non-traditional property types in the United States. (Florance et al. [2010]). The \$369 billion of REIT equity market capitalization held by companies focusing on non-traditional property types has multiplied eightfold from just \$43 billion a decade ago (Newell and Wen [2006]), which was only 14% of the overall REIT market capitalization at that time.

EXHIBIT 1 Equity REIT Market Capitalization by Property Sector

Property Sector	% of Total	Property Sector	% of Total
Retail	24.3%	Data Center	5.0%
Apartment	12.2%	Diversified	4.9%
Office	10.4%	Hotel	4.6%
Healthcare	9.8%	Specialty	3.0%
Infrastructure	7.9%	Timber	3.0%
Self-Storage	7.4%	Manuf Housing	1.2%
Industrial	5.4%	Single Family	0.8%

DO NON-TRADITIONAL PROPERTY SECTORS QUALIFY AS REAL ESTATE?

One of the chief barriers to investment in non-traditional property types for real estate managers is the subject of whether some of these sectors behave more like operational businesses. This question has important implications across several facets of the investment process, including the ability to manage the asset, realize objectives, and secure funding.

Managing operational risk and preparing or evaluating bids for non-traditional assets often requires specific skill sets that may not be present in traditional real estate firms. In addition, evaluating non-traditional sectors using metrics historically used in traditional sectors can lead to problems resulting from operational differences. Investment managers looking to diversify into non-traditional property sectors may need to joint venture, lift a management team out of a firm that specializes in the space, and/or find competent operators to run the assets.

The self-storage and senior housing sectors in particular are heavily reliant on the ability of operators to successfully manage the asset. The estimates of the breakdown between the real estate and operating/business components of these investments vary widely (Mullen [1999]).¹⁰ For example, significant differences in senior housing exist among independent living, assisted living, and nursing home facilities. As one moves up the continuum of care, the contribution of business value increases and the influence of real estate value on overall performance decreases (Eichholtz, Kok, and Wolnicki [2007]). According to Mueller and Laposi [1997], for independent living, approximately 55% of revenues can be assigned to real estate; however, this is reduced to 35% of revenues for assisted living and 25% of revenues for skilled nursing facilities.

Additional obstacles faced by investors looking at non-traditional property sectors have historically included (Deutsche Bank RREEF [2005]):

- Difficulties predicting cash flows;
- Reduced availability of leverage;
- Lack of consistent long-term performance measures;
- Insufficient size—low market capitalization being a barrier for large institutional investment, as well as the generally smaller size of asset-level investments;
- Lack of investor experience;

- Need for revised fund mandates to invest in these sectors; and
- Data and information capture that is not as robust or mature.

Part of the allure of non-traditional property sectors is that they potentially offer diversification to a real estate portfolio through different demand drivers and operating characteristics. A synopsis of some of the non-traditional sectors follows.

Self-Storage

Self-storage facilities have seen strong growth over the 20 years ending in 2016, increasing from an average of three square feet per capita to more than eight square feet per capita. Just under 9% of U.S. households currently rent self-storage space.

Despite the increased institutionalization of the market, ownership of self-storage remains very fragmented. Two public REITs, Public Storage and Extra Space Storage Inc., are the largest owners in the space, with Public Storage being the largest at over 151 million net rentable square feet (2,310 facilities).¹¹ The average self-storage property is just over 51,000 square feet, which enables local players/operators to have a significant role in this space. There are over 30,800 owner-operators with just 1 facility in the United States; 2,450 firms that own or operate 2 to 9 facilities; and 100 firms that own or operate more than 10 facilities (Mini-Storage Messenger [2015]). The fragmentation reminds many of where the hospitality market was in the 1980s, prior to a wave of industry consolidation. Self-storage ownership will likely continue to become more concentrated in the top 25 to 50 metropolitan statistical areas, where the top operators are focused because of higher rents and occupancy rates. The better-capitalized, national players can also afford the higher land costs in these areas.

Demand drivers for self-storage tend to be similar to multifamily, with the strongest being population and household growth, number of renters, and general awareness of self-storage as an option (Severino [2005]). Residential customers comprise the primary user base, accounting for approximately 70% of rentals.¹² Tenants can be grouped into three primary categories:

1. short-term (3–12 months)—demand deriving from life events, such as marriage, divorce, birth, death, relocation, moving, and college
2. longer-term (over 12 months)—military families and households without adequate garage, attic, or basement storage
3. commercial/business (12–36 months)—purposed as a mini-warehouse.

The Baby Boomer generation has driven much of the residential self-storage demand. Universal Storage Group has tracked the ages of their tenants since 2003, and the portion of their customer base aged 46 years or older rose from 32% to over 60% from 2003 to 2015. With over 50% of Boomers planning to relocate to a smaller residence at some point, there exists further potential tailwinds for the self-storage space. As a result, many facilities are offering amenities that appeal to this older demographic, including safety and accessibility features.

Having a variety of unit sizes within a particular structure facilitates a diverse tenant base and reduces risk to the operator if one or more tenants vacate. For institutional investors, the challenges of investing in self-storage include the following:

- The average tenant stay is 12–18 months with no lease; thus, finding a strong operating/management team is key to success because this is certainly a mix between an operating business and real estate.
- Barriers to entry are low.
- Deal sizes are small—investors may need to roll up their sleeves and aggregate a portfolio as part of their strategy to ensure an institutional exit.

Healthcare/Medical Office

Historically, healthcare real estate has been viewed as a niche sector; however, as the industry grows, it is becoming increasingly mainstream. The size of the healthcare real estate market has been estimated at \$1 trillion. According to Stifel Nicolaus, approximately 70% of the healthcare real estate universe is for profit, indicating that approximately \$700 billion may be available for institutional investors, of which approximately 35% is medical office.

The increased demand for healthcare and medical office space is being driven by several important factors, including demographics, healthcare reform, outpatient services, and medical advances.

Demographics. The U.S. population is getting older and living longer, driving an increased demand for healthcare. The oldest of the Baby Boomers turned 65 in 2011, and this generation will continue to reshape the age demographics of the United States. By 2026, the 65-and-over age cohort is projected to grow by nearly 3.8% per year, or 10 times faster than the under-65 population, according to the U.S. Census Bureau. Moreover, life expectancy beyond age 65 increased from 17.2 in 1990 to 20.6 years in 2015. This is an important trend because people demand more healthcare services as they age. The 65-and-over population accounts for just over 14% of the total population but nearly 27% of all visits to doctors' offices and 50% of all healthcare spending (Shilling [2011]).

Healthcare reform. Another source of increased use of healthcare services and facilities stems from the Patient Protection and Affordable Care Act and the Reconciliation Act (together, the Affordable Care Act [ACA]). According to the Congressional Budget Office, approximately 32 million in the United States gained access to health insurance, although repeal of ACA is on the table under the current administration.

Outpatient services and medical advances. With the ever-increasing costs of healthcare and the federal government facing massive deficits, the industry remains under pressure to reduce providers' expenses. One mechanism to accomplish this is to shift services from expensive hospital facilities to lower-cost outpatient settings. As a result, from 1995 to 2015, community hospitals doubled their revenue from outpatient services. Moreover, outpatient surgeries increasingly take place in off-campus facilities and physicians' offices as opposed to hospitals.

At the same time, doctors are increasingly attracted to larger group practices because of their struggles with increasing regulations, insurance costs, reimbursement limitations, and technological infrastructure. Hospitals are taking advantage by consolidating private practices into larger groups. The number of physicians who work in practices owned by a hospital or integrated delivery system surged from 24% in 2004 to 49% in 2011, according to the Medical Group Management Association (Kash and Tan [2016]). Some industry analysts expect that 80% of doctors will move to hospital-owned practices over the next several years, a trend that could create significant demand for institutional-grade medical office buildings.

From a medical office perspective, the hospital affiliation of the building or tenants and whether it is on- or off-campus can be important demand drivers for a building. Physicians are increasingly joining hospital systems as employees to control administrative costs. As a result, healthcare systems are rethinking their real estate strategies as well, and this change creates opportunity.

Senior Housing

Senior housing has long been looked upon warily by institutional investors, many of whom find it difficult to understand the operating component of the business. Senior housing is a combination of housing (e.g., apartments), hospitality services (e.g., hotels), and healthcare services (e.g., medical clinics); thus, it can be challenging to disentangle the drivers of performance for this asset class (Mueller, Fisher, and Wincott [2013]). The sector is often grouped under healthcare, but it is sometimes broken out separately, whether as its own asset class or by subclass (i.e., independent living, assisted living, or nursing care).

The strongest predictor of the demand for senior housing is the number of people aged 85 or older (Anikeef [1999]). The percentage of seniors who need help with activities of daily living comprises about 10% of those between ages 65 and 74, 25% between the ages of 75 and 85, and 50% over age 85 (Sexton [1998]). By 2035, the U.S. population of seniors over age 85 is projected to almost double, from 6.3 million in 2016 to 11.6 million, and the population of those over age 75 is expected to double from 20 million to 40 million.

This segment also includes differentiation by care, quality, operator involvement, and the influence of government/legislation (Mueller, Fisher, and Wincott [2013]). The performance of healthcare REITs has been stronger than integrated healthcare companies in the independent living space, but relative performance has been weaker in the assisted living and skilled nursing segments (Eichholtz, Kok, and Wolnicki [2007]). This performance is likely associated with the increased operational importance as one moves up the continuum of care because expertise contained within integrated healthcare companies may allow them to execute more efficiently.

Student Housing

Student housing is an increasingly accepted institutional real estate asset class. The percentage of

U.S. citizens participating in higher education has been steadily on the rise for decades. In the fall of 2016, about 21 million people, or 6.5% of the population, were attending U.S. colleges and universities (an increase of 5.2 million, or 25%, since 2000) (National Center for Education Statistics [2017]). This has dramatically increased the demand for student housing properties because approximately one-third of these students live in on- or off-campus student housing properties (Green Street Advisors [2013]).

Although investing in student housing is similar to multifamily in some respects, there are important differentiating factors:

- Student housing tends to be more operationally intensive; thus, operating margins are slightly lower.
- Units are usually furnished, and rentals are typically by the bed as opposed to the unit.
- The availability/cost of student debt is a significant demand driver.
- The turnover period tends to be concentrated around the academic calendar.

One of the primary distinctions in the student housing sector (similar to medical office/healthcare) is whether the property is on- or off-campus. On-campus properties tend to be favored by investors, with their locational advantages, higher occupancies, and stronger historical rent growth; furthermore, the university functions as a partner looking to support the property. However, these properties have longer lead times from a development perspective and face other issues with university partners, such as operational control. Ground-lease structures are common for these deals as well, which is less attractive for investors. Off-campus properties can benefit from increased ownership control and a quicker development cycle, but they are susceptible to vacancy risk from enrollment declines, new competitive supply, or changing student tastes (Green Street Advisors [2013]).

Manufactured Homes

Manufactured/mobile homes make up approximately 7% of U.S. housing stock, with the majority being in the southern part of the United States. The owner/landlord of these assets typically owns the land, which is divided into lots. The tenant pays one or two

rents: (1) for the land/pad on which the home sits or (2) for the land and the home itself. Complexities can arise when there are tenant-owned homes, particularly when it comes to underwriting during the acquisition process. Differentiating factors among mobile home parks include density, home vintage, amenities, quality of subdivision/utilities, and parking.

HISTORICAL PERFORMANCE OF NON-TRADITIONAL REAL ESTATE

As non-traditional property sectors gain acceptance as institutional-quality investments, major industry data aggregators/providers are increasingly collecting information and tracking their performance. The National Council of Real Estate Investment Fiduciaries (NCREIF) has assembled 10 years of historical performance for several non-traditional property sectors. In addition, approximately 20 years of performance history exists from the public REITs. The results that follow should be tempered by the lack of robust data available. For the NCREIF series in particular, the low sample sizes mean the reader should be cautious in interpreting the results and should note that this article is an attempt to move the research forward on non-traditional property sectors, but more analysis should be done as historical data become more robust.¹³ We focus on non-traditional sectors that have begun to become popular with investors, not all possible non-traditional property sectors.

For investors considering expanding into non-traditional property sectors or creating a more efficient risk-adjusted real estate portfolio, major questions include the following:

- What is the risk-adjusted performance of non-traditional property sectors versus traditional property sectors?
- Does adding non-traditional property sectors to the mix improve the efficient frontier¹⁴ by boosting the portfolio's desired rate of return (without a corresponding increase in volatility) or reducing volatility (while holding the desired rate of return constant)?

To address these questions, the REIT sector is analyzed first. Non-traditional property sectors have shown some of the strongest historical absolute and risk-

EXHIBIT 2

REIT Performance by Property Type

	Traditional Property Sectors						Non-Traditional Property Sectors			
	Total	Multifamily	Office	Enclosed Mall	Shopping Center	Industrial	Hotel	Self-Storage	Healthcare	Manufactured Homes
Total Return										
3-Year	10.8%	16.3%	10.7%	11.1%	13.4%	10.2%	8.9%	26.2%	5.0%	26.7%
5-Year	3.6%	4.3%	1.6%	6.5%	2.1%	2.7%	-0.3%	7.3%	2.9%	5.0%
10-Year	3.6%	6.7%	1.6%	4.0%	-0.5%	-2.5%	-0.8%	8.6%	8.7%	5.9%
15-Year	8.6%	9.4%	5.3%	13.1%	7.5%	4.5%	3.2%	14.5%	14.4%	6.6%
20-Year	9.0%	10.9%	8.0%	12.2%	8.2%	7.3%	2.9%	12.5%	10.5%	8.1%
Standard Deviation										
3-Year	7.9%	14.1%	7.8%	11.0%	9.3%	7.4%	16.3%	10.3%	15.6%	14.6%
5-Year	10.3%	14.5%	10.5%	14.3%	11.8%	16.2%	18.2%	9.7%	13.8%	12.3%
10-Year	27.6%	31.4%	31.3%	43.7%	28.4%	31.5%	46.7%	22.1%	21.5%	21.0%
15-Year	24.1%	26.9%	26.9%	37.7%	25.3%	27.1%	40.8%	21.1%	24.0%	19.0%
20-Year	22.8%	24.2%	26.5%	34.6%	23.2%	24.9%	40.0%	20.9%	24.3%	17.7%
Sharpe Ratio										
3-Year	1.35	1.16	1.36	1.00	1.44	1.38	0.54	2.54	0.32	1.83
5-Year	0.34	0.29	0.15	0.45	0.17	0.17	(0.02)	0.75	0.21	0.40
10-Year	0.09	0.18	0.02	0.07	(0.06)	(0.11)	(0.04)	0.34	0.35	0.23
15-Year	0.30	0.30	0.14	0.31	0.24	0.11	0.04	0.62	0.54	0.27
20-Year	0.29	0.35	0.21	0.28	0.25	0.20	0.01	0.49	0.34	0.32

adjusted returns, both over recent history and going back to 1995, according to SNL Financial data (see Exhibit 2). The self-storage space, in particular, has demonstrated outsized performance, with the highest absolute and risk-adjusted returns over the past 5, 15, and 20 years.

It is reasonable to expect that in the REIT sector, adding non-traditional property sectors to a real estate portfolio would improve risk-adjusted performance, particularly given that return correlations between non-traditional property sectors and traditional property sectors are lower than correlations between property types within the traditional sector (Exhibit 3). This has persisted over time—as the non-traditional sectors have matured, one might expect that volatility would converge, but this has not been the case to date (see Appendix A of the online supplement for historical REIT correlation tables).

Similar trends are found when analyzing unlevered, property-level returns for private real estate using NCREIF data. On an absolute basis, non-traditional property sector returns compare favorably with traditional sectors. One of the criteria for the NCREIF Property Index (NPI) is that it only includes the five major property sectors; the NPI Plus, however, includes

all property sectors. As of Q3 2016, non-traditional sectors made up 6.6% of the NPI Plus Index by count and 3.2% by market value. Using the NPI Plus as a proxy, average annual returns for the NPI are 9.8% since 2003,¹⁵ versus 12.8% for the non-traditional property sectors. The “Non-Traditional Only” index has outperformed over most time periods, with a beta of 0.72 and an R^2 of 0.81, relative to the NPI.

The NCREIF self-storage and senior living performance has been particularly strong (Exhibit 4). The volatility for non-traditional property sectors has been higher over the three- and five-year historical periods, although this may be somewhat attributable to smaller sample sizes; thus, risk-adjusted returns for non-traditional property investment may be understated.

For private equity, return correlations for non-traditional property sectors versus traditional are even lower than they are among REITs (Exhibit 5). Adding non-traditional property sectors to the mix should improve risk-adjusted performance for private equity real estate as well. This trend has actually shown improvement over time—over the historical five-year period, correlations of non-traditional property sectors to traditional have

EXHIBIT 3

Correlation Table of 15-Year REIT Total Returns by Sector

	Traditional Property Sectors						Non-Traditional Property Sectors			
	Total	Multifamily	Office	Enclosed Mall	Shopping Center	Industrial	Hotel	Self-Storage	Healthcare	Manufactured Homes
Total	1.00	0.92	0.97	0.95	0.94	0.93	0.91	0.83	0.78	0.75
Multifamily	0.92	1.00	0.93	0.84	0.82	0.80	0.83	0.82	0.66	0.77
Office	0.98	0.93	1.00	0.93	0.90	0.90	0.93	0.79	0.74	0.73
Enclosed Mall	0.95	0.84	0.93	1.00	0.89	0.88	0.91	0.73	0.76	0.74
Shopping Center	0.94	0.82	0.90	0.89	1.00	0.94	0.79	0.80	0.78	0.66
Industrial	0.93	0.80	0.90	0.88	0.94	1.00	0.82	0.72	0.70	0.62
Hotel	0.91	0.83	0.93	0.91	0.79	0.82	1.00	0.65	0.67	0.68
Self-Storage	0.83	0.82	0.79	0.73	0.80	0.72	0.65	1.00	0.76	0.68
Healthcare	0.79	0.66	0.74	0.76	0.78	0.70	0.67	0.76	1.00	0.64
Manufactured Homes	0.75	0.77	0.73	0.74	0.66	0.62	0.68	0.68	0.64	1.00

EXHIBIT 4

NCREIF Performance by Property Type

	Traditional Property Sectors						Non-Traditional Property Sectors				
	Multifamily	Office	Mall	Shopping Center	Industrial	Hotel	Self-Storage	Healthcare	Senior Living	Medical Office	Student Housing
Total Return											
3-Year	10.9%	11.6%	15.1%	12.8%	13.6%	10.6%	20.2%	8.9%	16.9%	9.7%	10.2%
5-Year	11.9%	11.6%	14.4%	12.5%	13.2%	10.4%	20.3%	9.3%	14.6%	8.9%	10.9%
10-Year	7.3%	7.6%	10.2%	7.7%	7.8%	6.6%	11.3%	8.5%	11.7%	7.1%	7.4%
Standard Deviation											
3-Year	0.9%	1.4%	0.7%	0.8%	1.3%	2.9%	2.2%	0.9%	2.2%	1.3%	1.1%
5-Year	1.6%	1.6%	0.9%	1.1%	1.6%	2.6%	3.0%	1.2%	4.0%	1.7%	1.2%
10-Year	11.4%	12.3%	8.8%	8.9%	11.2%	12.7%	12.6%	4.9%	7.5%	6.7%	7.8%
Sharpe Ratio											
3-Year	12.31	8.08	20.42	16.47	10.74	3.62	8.99	9.55	7.64	7.67	9.01
5-Year	7.35	7.21	15.89	11.84	8.38	4.05	6.71	8.06	3.67	5.21	9.13
10-Year	0.55	0.53	1.03	0.74	0.59	0.43	0.81	1.51	1.40	0.90	0.80

Note: Student Housing data begin in Q4 2007.

actually gone negative in many cases (see Appendix B of the online supplement for historical NCREIF correlation tables).

COMMERCIAL REAL ESTATE PORTFOLIO ENHANCEMENT

Given the relatively strong absolute returns and diversification benefits that non-traditional property types offer, the next step is to determine the allocation to these sectors in a diversified real estate portfolio and

the marginal contribution to the expected risk–return. To accomplish this, the mean-variance analysis component of Modern Portfolio Theory is applied to determine the differences in the efficient frontiers for portfolios with and without investments in the non-traditional property sectors.

The REIT optimization relies on 15 years of quarterly historical performance data and current market capitalization to develop expected risk, performance, and constraints. To account for the differing size of each property sector, constraints are used to determine the

EXHIBIT 5

Correlation Table of 10-Year NCREIF Total Returns by Sector

	Traditional Property Sectors						Non-Traditional Property Sectors				
	Multifamily	Office	Enclosed Mall	Shopping Center	Industrial	Hotel	Self-Storage	Healthcare	Senior Living	Medical Office	Student Housing
Multifamily	1.00	0.95	0.97	0.97	0.96	0.92	0.80	0.58	0.69	0.91	0.86
Office	0.95	1.00	0.95	0.96	0.98	0.99	0.80	0.70	0.78	0.95	0.75
Mall	0.97	0.95	1.00	0.99	0.98	0.93	0.89	0.61	0.73	0.92	0.79
Shopping Center	0.97	0.96	0.99	1.00	0.99	0.94	0.88	0.61	0.76	0.94	0.83
Industrial	0.96	0.98	0.98	0.99	1.00	0.97	0.88	0.67	0.78	0.95	0.76
Hotel	0.92	0.99	0.93	0.94	0.97	1.00	0.78	0.69	0.81	0.95	0.73
Self-Storage	0.80	0.80	0.89	0.88	0.88	0.78	1.00	0.67	0.65	0.79	0.62
Healthcare	0.58	0.70	0.61	0.61	0.67	0.69	0.67	1.00	0.44	0.65	0.32
Senior Living	0.69	0.78	0.73	0.76	0.78	0.81	0.65	0.44	1.00	0.76	0.60
Medical Office	0.91	0.95	0.92	0.94	0.95	0.95	0.79	0.65	0.76	1.00	0.80
Student Housing	0.86	0.75	0.79	0.83	0.76	0.73	0.62	0.32	0.60	0.80	1.00

EXHIBIT 6

REIT Portfolio Optimization Constraints, Traditional Property Sector Only

Sector	As of Q4 2015	Min	Max
Multifamily	25.2%	0.0%	40.0%
Enclosed Mall	21.5%	0.0%	35.0%
Office	21.5%	0.0%	35.0%
Shopping Center	11.2%	0.0%	25.0%
Industrial	11.2%	0.0%	25.0%
Hotel	9.5%	0.0%	20.0%

optimal portfolio mix that would be actionable for large institutional investors. Exhibits 6 and 7 show market capitalization as of the end of 2015 and the percentage constraints allocated to each sector for the optimization exercise.

Running the portfolio optimization using these constraints indicates that adding non-traditional property sectors raises the efficient frontier significantly for a diversified real estate portfolio (Exhibit 8). Based on historical performance, a strong case can be made for including non-traditional sectors in a diversified REIT portfolio. Non-traditional property sectors make up 60%–70% of the total portfolio allocation across the non-traditional efficient frontier, with both healthcare and self-storage having their allocations maxed out at every point along the frontier. This compares to a market capitalization for these specified non-traditional sectors of just 27.5% of the total REIT

EXHIBIT 7

REIT Portfolio Optimization Constraints, Including Non-Traditional Sectors

Sector	As of Q4 2015	Min	Max
Multifamily	18.3%	0.0%	35.0%
Enclosed Mall	15.6%	0.0%	30.0%
Office	15.6%	0.0%	35.0%
Healthcare	14.7%	0.0%	35.0%
Self-Storage	11.1%	0.0%	25.0%
Shopping Center	8.1%	0.0%	20.0%
Industrial	8.1%	0.0%	20.0%
Hotel	6.9%	0.0%	15.0%
Manufactured Housing	1.7%	0.0%	10.0%

market capitalization at the end of 2015. Increasing the allocation to non-traditional property sectors would enhance returns by approximately 600 bps for the same level of risk.

When analyzing the NCREIF index, enhancements are also found to the efficient frontier when including non-traditional property sectors.¹⁶ Exhibit 9 shows market capitalization as of the end of 2015 and the percentage constraints allocated to each property sector.¹⁷ Note that these allocations are significantly lower in the private equity space than for public REITs.

When running the NCREIF portfolio optimization using these constraints, adding non-traditional

EXHIBIT 8

REIT Efficient Frontier, with and without Non-Traditional Property Sectors

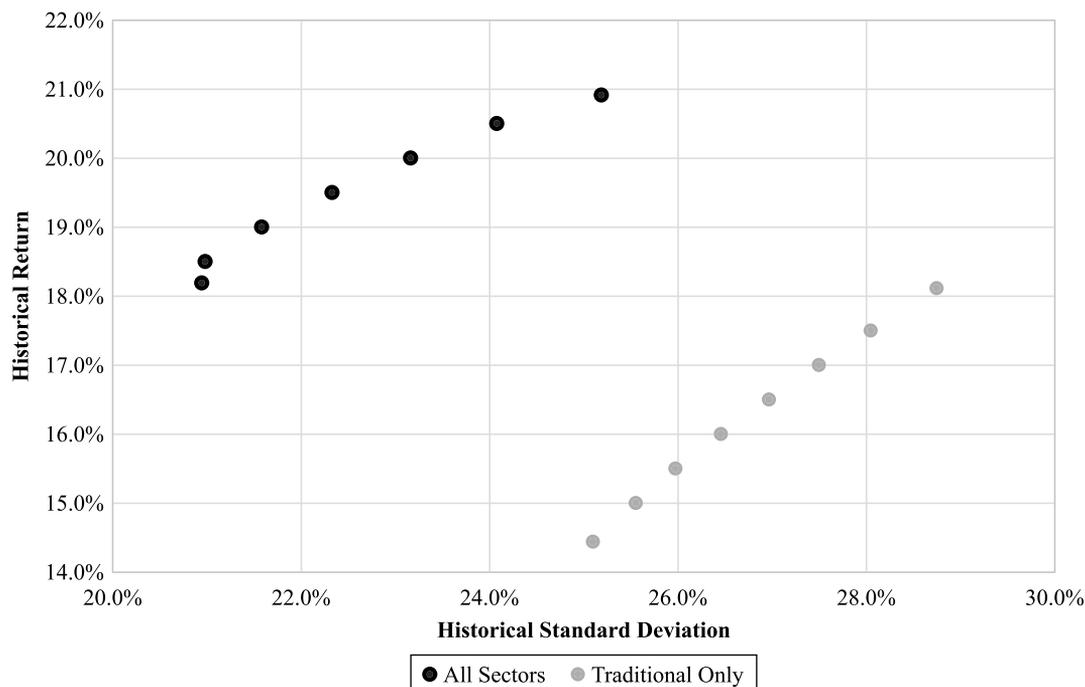


EXHIBIT 9

NCREIF Portfolio Optimization Constraints

Sector	As of Q4 2015	Min	Max
Office	37.6%	25.0%	45.0%
Multifamily	24.6%	15.0%	35.0%
Industrial	14.8%	10.0%	20.0%
Enclosed Mall	12.1%	5.0%	15.0%
Shopping Center	6.6%	3.0%	10.0%
Self-Storage	1.4%	0.0%	10.0%
Hotel	1.2%	0.0%	10.0%
Senior Living	0.7%	0.0%	10.0%
Healthcare	0.6%	0.0%	10.0%
Student Housing	0.3%	0.0%	10.0%
Medical Office	0.2%	0.0%	10.0%

property sectors raises the efficient frontier, although the result is not as pronounced as it is for the REIT sector (Exhibit 10).¹⁸ Although the allocation to non-traditional property sectors made up just 4.2% of the total NCREIF index as of Q4 2015, given these constraints, the efficient frontier including all sectors

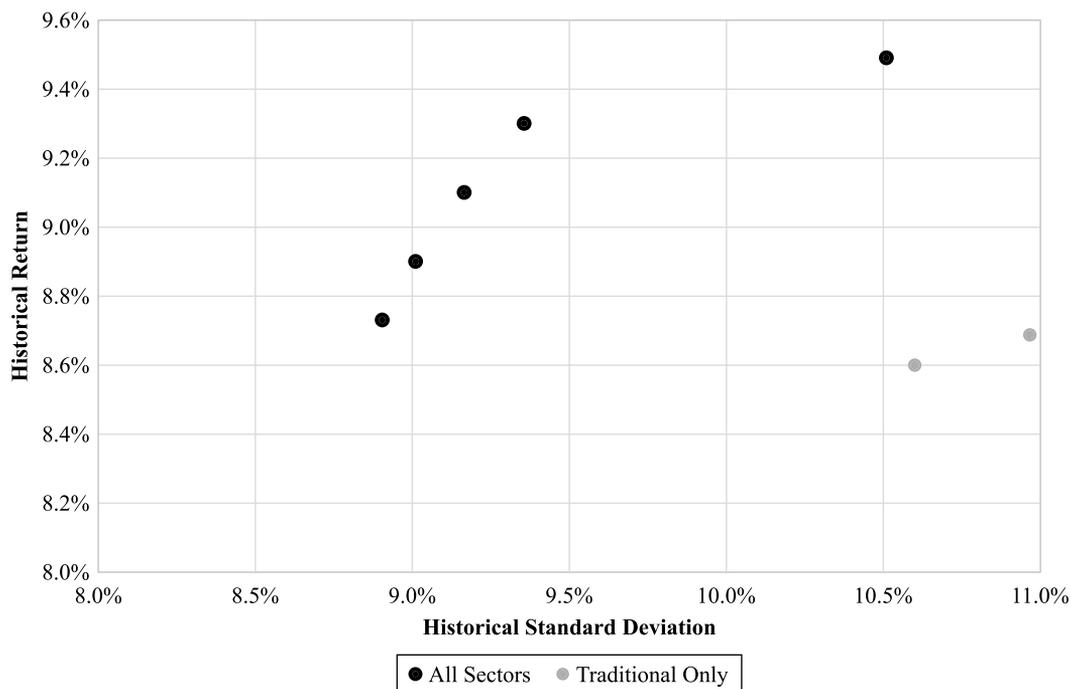
consists of allocations to non-traditional property sectors of between 20% and 40%.

CONCLUSION

Institutional demand for commercial real estate investment continues to grow. As investors seek to place large amounts of capital and search for yield, they will continue to consider non-traditional property sectors. Although these sectors pose different challenges, this article finds that adding non-traditional sectors to a diversified real estate portfolio could enhance risk-adjusted returns. In fact, the historical data available indicate that investors should consider significantly overweighting many of these non-traditional sectors, relative to current industry benchmarks, to the extent they have the internal expertise to execute the strategy. However, lower returns and higher correlations may be seen going forward, to the extent that capital flows are more integrated and the non-traditional markets become more mature, as the overall real estate market continues to become more efficient (Clayton et al [2011]; MacKinnon [2010]).

EXHIBIT 10

NCREIF Efficient Frontier, with and without Non-Traditional Property Sectors



ENDNOTES

¹Timberland and farmland are attracting increased institutional capital as well, but would probably be categorized under agriculture in the real assets classification.

²The P7 includes the United States, Australia, Japan, Netherlands, Canada, Switzerland, and the United Kingdom.

³Of this, \$21.8 trillion (66%) was held by U.S. pension plans, as of 2015.

⁴Calculated by updating the estimates made by Florance et al. [2010] through December 2015.

⁵Fixed income and equity market size are taken from Federal Reserve Flow of Funds data, March 10, 2016.

⁶Transaction data were sourced from Real Capital Analytics.

⁷The NCREIF Fund Index—Open End Diversified Core Equity, as of Q1 2017.

⁸For the purposes of this article, traditional property types are defined as multifamily, office, retail, industrial, and hotel. All other property types are categorized as non-traditional. We do not include timberland or farmland in the analysis.

⁹NAREIT, as of March 31, 2016.

¹⁰Depending on the methodology used (revenue versus operating expenses), estimates among the various types of

senior housing range from being 19% real estate to 74% real estate—a wide range. Based on cap rates, they believe the market is pricing the real estate component close to 60%.

¹¹Per Public Storage financial reports, as of Q2 2016.

¹²Businesses comprise 17.5% of tenants, students 6.3%, and military families 6.2% (per Mini-Storage Messenger [2016]).

¹³As of Q4 2015, the NCREIF non-traditional property sectors had between 23 and 193 properties reporting, whereas the four major property sectors had between 1,141 and 3,082 properties reporting.

¹⁴We recognize that the shortcomings and strengths of the efficient frontier analysis in real estate and other asset classes are well documented, including the specificity of weightings (Cheng and Liang [2000]).

¹⁵Through Q3 2016.

¹⁶The NCREIF optimization relies on 10 years of historical performance data because this is the extent of the history for many of the non-traditional property sectors' performance.

¹⁷Note that because the allocation to non-traditional property sectors by those reporting to NCREIF is relatively small, we use the same percentage constraints for the traditional property sectors in both the traditional-only and all-sector portfolio optimizations.

¹⁸This is due in large part to appraisal smoothing and reduced volatility in the NCREIF portfolio, which reduces the diversification benefits offered by some of the non-traditional property sectors relative to the REIT indexes.

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