



# CAN REAL ESTATE INVESTMENT AND DIVERSIFICATION BE IMPROVED?

*Nicholas Reynolds*

*Assistant Vice President & Portfolio Manager*

## OVERVIEW

In research last year, we showed the benefits of investing in real estate investment trusts (REITs) include increased income and protection against inflation when held as part of a diversified portfolio. The research validated the investment in liquid REITs as part of a diversified portfolio mix that is designed to increase return for the level of risk over the long term. As we noted in the research, these benefits of REITs help explain some of the reasons why this asset class has been increasingly attractive, and why we include them in our portfolio investment strategy at Washington Trust Bank.

However, real estate investors are not limited to REITs when allocating investments as part of their wealth building strategy. While the market capitalization of all US REITs (equity, mortgage, and hybrid) was \$938.9 billion at the end of 2015, investors also hold illiquid real estate outside of their investment portfolio in the form of residential, apartment, industrial, office, and specialty properties – to name a few real estate property sectors. Similar to marketable investments, investors in real estate, through these property sectors, seek to build wealth for a reasonable level of risk and manage their investments to do so.

In an attempt to expand upon the research and knowledge on real estate investment, this white paper seeks to improve real estate investment exposure and increase return for the level of risk over the long term when compared to the existing broadly diversified REIT index. Through this process of research and analysis, we review real estate property sector performance and attempt to provide additional insight into real estate investing. We also seek to understand real estate property sector performance in various economic and market environments, including economic expansion or contraction, and rising or declining real estate.

We believe this research could be beneficial for clients of Washington Trust Bank, as well as real estate investors who are trying to understand the performance and risks of real estate investing.



<sup>1</sup> *Washington Trust Bank Wealth Management & Advisory Services*

Washington Trust Bank believes that the information used in this study was obtained from reliable sources, but we do not guarantee its accuracy. Neither the information nor any opinion expressed constitutes a solicitation for business or a recommendation for the purchase or sale of securities or commodities.



## STUDY METHODOLOGY

To better understand real estate investing and sector performance, we reviewed the performance of marketable REIT property sector indices in the FTSE NAREIT All Equity REITs Total Return Index and compared returns from 7/1/2006 to 6/30/2016. We reviewed performance data for REIT property sector indices including FTSE NAREIT Health Care, FTSE NAREIT Self Storage, FTSE NAREIT Industrial, FTSE NAREIT Office, FTSE NAREIT Residential, FTSE NAREIT Apartments, FTSE NAREIT Manufactured Homes, FTSE NAREIT Retail, FTSE NAREIT Shopping Centers, FTSE NAREIT Shopping Malls, FTSE NAREIT Regional Malls, FTSE NAREIT Free Standing, FTSE NAREIT Lodging/Resorts, and FTSE NAREIT Diversified. The following REIT property sectors were not included as performance data was unavailable: FTSE NAREIT Single Family Homes, FTSE NAREIT Data Centers, FTSE NAREIT Specialty, FTSE NAREIT Timber, and FTSE NAREIT Infrastructure. We compared the returns, standard deviations, and Sharpe ratios of the REIT property sector indices to the FTSE NAREIT All Equity REITs Total Return Index over the same period of time.

- Appendix 1 details the performance of marketable REIT property sector indices over the entire period of study.

To determine if investing in real estate through a broadly diversified REIT index could be improved, a portfolio of marketable REIT property sector indices (represented by the previously identified indices) was optimized to maximize return for the level of risk (or risk-adjusted return). The optimized portfolio of REIT property sector indices was then compared to the broadly diversified FTSE NAREIT All Equity REITs Total Return Index using total return, standard deviation (risk), and Sharpe ratio (risk-adjusted return).

- Appendix 2 details the asset allocation for the optimized REIT property sector indices portfolio.

To further understand real estate investing and sector performance, we reviewed marketable REIT property sector indices and compared performance in various economic and market environments including expanding economy (7/1/2009 to 6/30/2016), contracting economy (1/1/2008 to 6/30/2009), rising real estate (3/1/2009 to 6/30/2016), and declining real estate (2/1/2007 to 2/28/2009). The optimized portfolio was then compared to the broadly diversified FTSE NAREIT All Equity REITs Total Return Index in the same time periods.

Definition of terms and additional information on the study methodology are detailed in Appendix 3 and Appendix 4. As discussed previously, the period of review for this study was 7/1/2006 through 6/30/2016 due to availability of data.

## ANALYSIS AND RESULTS

In an attempt to improve real estate investing and provide insight into real estate sector performance in different economic environments, a portfolio of marketable REIT property sector indices (represented by the previously identified indices) was optimized to maximize return for the level of risk (or risk-adjusted return) over the period of analysis



(7/1/2006 through 6/30/2016). As shown in Appendix 2, the optimized portfolio was allocated to the Self Storage, Manufactured Homes, and Free Standing property sectors. As an introduction, a brief definition from FTSE Russell and information on the three identified property sectors follows:

- **Self Storage** are REITs that mostly own, manage, and lease self-storage properties. Self storage REITs are heavily affected by moving activity, which results in people needing storage space for the short and/or long term (Leon, 2016).
- **Manufactured Homes** are REITs that mostly own, manage, and lease manufactured home communities. The property sector is driven by demand for inexpensive housing, especially in the retirement and vacation home markets. As manufactured homes are factory-built, they are more affordable than single-family site-built houses or apartments. The REITs own the underlying land, infrastructure, and common-area amenities. Due to the high cost to move manufactured homes, turnover is low, creating stability of income and occupancy for the REITs. (Persin, 2015).
- **Free Standing** are REITs that mostly own, manage, and lease single-tenant, free-standing properties. The free-standing buildings owned by these REITs are mostly occupied by nationally known, nondiscretionary and service businesses that are less vulnerable to online retail including drugstores, convenience stores, restaurants, health and fitness studios, and dollar stores. The leases are typically long-term and completed on a triple-net basis, which means that the tenant is responsible for building property taxes, insurance, and maintenance. Income growth and rent growth are guaranteed through long-term triple-net leases (Persin, 2016).

The optimized portfolio was compared to a broadly diversified REIT index to determine if real estate investing could be improved. Table 1 compares the performance of the optimized portfolio against the FTSE NAREIT All Equity REITs Total Return index and compared returns from 7/1/2006 to 6/30/2016.

<i>Table 1</i>	<i>Total Return (07/01/2006 to 06/30/2016)</i>	<i>Standard Deviation (07/01/2006 to 06/30/2016)</i>	<i>Sharpe Ratio (07/01/2006 to 06/30/2016)</i>
FTSE NAREIT All Equity REITs TR USD	7.45	25.39	0.38
REIT Property Sector Opt. Portfolio	16.18	20.73	0.78

The return data shows that the optimized portfolio significantly outperformed in the time period analyzed. In addition, the optimized portfolio demonstrated much less risk as measured by standard deviation. Standard deviation is one statistical measure of volatility, or risk, as the measure shows dispersion of returns to the mean (return). The optimized portfolio outperformed the FTSE NAREIT All Equity REITs Total Return index on a risk-adjusted basis as demonstrated by the higher Sharpe ratio. The Sharpe ratio, a measure of risk-adjusted return, indicates the amount of excess return that is received for the given level risk. The Sharpe ratio is calculated by dividing the index's excess return (to the risk-free rate) by the respective standard deviation.



To gain further understanding of property sector performance in various economic and market environments, we then reviewed marketable REIT property sector indices and compared performance in an expanding economy (7/1/2009 to 6/30/2016) and a contracting economy (1/1/2008 to 6/30/2009). The time periods for expanding and contracting economy were identified using long-term directional changes in US Gross Domestic Product (GDP) as reported quarterly by the US Bureau of Economic Analysis (BEA). Table 2 compares the performance of marketable REIT property sector indices in an expanding economic environment and a contracting economic environment.

<i>Table 2</i>	<i>Expanding Economy</i>			<i>Contracting Economy</i>		
	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>
	<i>(07/01/2009 to 06/30/2016)</i>	<i>(07/01/2009 to 06/30/2016)</i>	<i>(07/01/2009 to 06/30/2016)</i>	<i>(01/01/2008 to 06/30/2009)</i>	<i>(01/01/2008 to 06/30/2009)</i>	<i>(01/01/2008 to 06/30/2009)</i>
FTSE NAREIT All Equity REITs TR USD	20.65	17.01	1.19	-33.14	50.88	-0.55
FTSE NAREIT Eqty Apartments TR	23.06	19.26	1.18	-25.30	44.56	-0.45
FTSE NAREIT Eqty Diversified TR	17.64	18.59	0.97	-32.14	55.43	-0.44
FTSE NAREIT Eqty Free Standing TR	19.77	17.43	1.12	-9.85	37.63	-0.12
FTSE NAREIT Eqty Health Care TR	17.57	18.56	0.96	-16.03	48.20	-0.15
FTSE NAREIT Eqty Industrial TR	20.33	23.48	0.91	-61.13	96.61	-0.47
FTSE NAREIT Eqty Lodging/Resorts TR	15.86	26.59	0.68	-42.58	79.00	-0.36
FTSE NAREIT Eqty Manufactured Homes TR	27.67	18.20	1.44	-13.90	38.09	-0.23
FTSE NAREIT Eqty Office TR	17.17	19.48	0.91	-35.89	52.45	-0.59
FTSE NAREIT Eqty Regional Malls TR	26.47	20.34	1.26	-46.10	73.80	-0.49
FTSE NAREIT Eqty Residential TR	23.56	18.96	1.21	-24.79	43.81	-0.45
FTSE NAREIT Eqty Retail TR	23.27	18.40	1.23	-40.87	62.04	-0.55
FTSE NAREIT Eqty Self Storage TR	28.35	18.57	1.44	-8.20	41.04	-0.03
FTSE NAREIT Eqty Shopping Centers TR	19.72	18.42	1.07	-40.10	60.93	-0.54
FTSE NAREIT Equity Specialty TR USD						
FTSE NAREIT Timber REITs TR USD						
FTSE NAREIT Eqty Data Centers						
FTSE NAREIT Eqty Infrastructure REITs						
FTSE NAREIT Eqty Single Family Homes						

Analysis of REIT property sector performance using the Sharpe ratio in an expanding economy shows that Self Storage, Manufactured Homes, Regional Malls, Retail, and Residential were the leading performing property sectors for the level of risk. In a contracting economic environment, we can observe that Self Storage, Free Standing, Health Care, Manufactured Homes, and Lodging/Resorts were the most defensive performing property sector investments. Combined, we find that the Self Storage and Manufactured Homes were the property sectors that outperformed in both expanding and contracting



economic environments in the period of analysis (7/1/2006 through 6/30/2016).

We then reviewed marketable REIT property sector indices and compared performance in rising real estate (3/1/2009 to 6/30/2016) and declining real estate (2/1/2007 to 2/28/2009) environments. These rising and declining real estate time periods were identified using long-term directional changes in the FTSE NAREIT All Equity REITs index. Table 3 compares the performance of marketable REIT property sector indices in rising and declining real estate environments.

<i>Table 3</i>	<i>Rising Real Estate</i>			<i>Declining Real Estate</i>		
	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>
	<i>(03/01/2009 to 06/30/2016)</i>	<i>(03/01/2009 to 06/30/2016)</i>	<i>(03/01/2009 to 06/30/2016)</i>	<i>(02/01/2007 to 02/28/2009)</i>	<i>(02/01/2007 to 02/28/2009)</i>	<i>(02/01/2007 to 02/28/2009)</i>
FTSE NAREIT All Equity REITs TR USD	24.51	19.96	1.20	-42.39	36.79	-1.35
FTSE NAREIT Eqty Apartments TR	27.14	20.86	1.26	-41.90	34.02	-1.47
FTSE NAREIT Eqty Diversified TR	21.64	23.09	0.96	-42.53	37.86	-1.30
FTSE NAREIT Eqty Free Standing TR	22.73	18.20	1.22	-18.76	30.91	-0.61
FTSE NAREIT Eqty Health Care TR	20.32	19.30	1.05	-23.33	41.37	-0.50
FTSE NAREIT Eqty Industrial TR	25.75	26.59	0.99	-58.87	76.87	-0.75
FTSE NAREIT Eqty Lodging/Resorts TR	25.85	36.55	0.79	-57.73	40.53	-1.90
FTSE NAREIT Eqty Manufactured Homes TR	29.61	19.09	1.46	-26.61	30.52	-0.94
FTSE NAREIT Eqty Office TR	20.40	22.27	0.94	-44.42	37.69	-1.40
FTSE NAREIT Eqty Regional Malls TR	33.37	29.01	1.12	-55.64	45.50	-1.53
FTSE NAREIT Eqty Residential TR	27.52	20.47	1.29	-41.28	33.61	-1.46
FTSE NAREIT Eqty Retail TR	27.82	23.76	1.15	-48.81	42.60	-1.36
FTSE NAREIT Eqty Self Storage TR	30.50	19.59	1.46	-29.22	33.34	-0.94
FTSE NAREIT Eqty Shopping Centers TR	22.78	23.04	1.00	-46.09	43.92	-1.20
FTSE NAREIT Equity Specialty TR USD						
FTSE NAREIT Timber REITs TR USD						
FTSE NAREIT Eqty Data Centers						
FTSE NAREIT Eqty Infrastructure REITs						
FTSE NAREIT Eqty Single Family Homes						

The Sharpe ratio shows that risk-adjusted performance in a rising real estate environment was strongest for Self Storage, Manufactured Homes, Residential, Apartments, and Free Standing. When real estate declined, the best performing property sectors were Health Care, Free Standing, Industrial, Self Storage, and Manufactured Homes. Here, we can also observe commonality as Self Storage, Manufactured Homes, and Free Standing property sectors outperformed in both rising and declining real estate environments.



Finally, the optimized portfolio (allocated to the Self Storage, Manufactured Homes, and Free Standing property sectors) was compared to the FTSE NAREIT All Equity REITs Total Return index in the different economic environments (as stated previously). Below, Table 4 compares the performance of the REIT portfolio against the broad in an expanding economic environment and a contracting economic environment. Table 5 shows the comparison in rising and declining real estate environments.

<i>Table 4</i>	<i>Expanding Economy</i>			<i>Contracting Economy</i>		
	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>
	<i>(07/01/2009 to 06/30/2016)</i>	<i>(07/01/2009 to 06/30/2016)</i>	<i>(07/01/2009 to 06/30/2016)</i>	<i>(01/01/2008 to 06/30/2009)</i>	<i>(01/01/2008 to 06/30/2009)</i>	<i>(01/01/2008 to 06/30/2009)</i>
FTSE NAREIT All Equity REITs TR USD	20.65	17.01	1.19	-33.14	50.88	-0.55
REIT Property Sector Opt. Portfolio	26.16	16.15	1.53	-9.73	36.46	-0.13

<i>Table 5</i>	<i>Rising Real Estate</i>			<i>Declining Real Estate</i>		
	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>	<i>Total Return</i>	<i>Standard Deviation</i>	<i>Sharpe Ratio</i>
	<i>(03/01/2009 to 06/30/2016)</i>	<i>(03/01/2009 to 06/30/2016)</i>	<i>(03/01/2009 to 06/30/2016)</i>	<i>(02/01/2007 to 02/28/2009)</i>	<i>(02/01/2007 to 02/28/2009)</i>	<i>(02/01/2007 to 02/28/2009)</i>
FTSE NAREIT All Equity REITs TR USD	24.51	19.96	1.20	-42.39	36.79	-1.35
REIT Property Sector Opt. Portfolio	28.53	16.82	1.58	-25.13	29.79	-0.91

The risk-adjusted return shows the optimized portfolio had greater performance for the level of risk in both expanding economy and rising real estate environments. In addition, the portfolio was more defensive in contracting economy and declining real estate environments.

## CONCLUSION

Through the research and analysis process, we optimized a portfolio of marketable REIT property sector indices to maximize return for the level of risk. We conclude that real estate investment performance could be improved by investing in the optimized portfolio over the broadly diversified FTSE NAREIT All Equity REITs Total Return index in the period of analysis (7/1/2006 through 6/30/2016). This conclusion is supported by the performance data, as measured by total return, standard deviation (risk), and Sharpe ratio (risk-adjusted return). As presented in the research, the optimized portfolio was allocated to the Self Storage, Manufactured Homes, and Free Standing property sectors.

Next, we supported the construction of the optimized portfolio by showing that Self Storage and Manufactured Homes property sectors outperformed in both an expanding (7/1/2009 to 6/30/2016) and contracting economy (1/1/2008 to 6/30/2009). In addition,



we found that Self Storage, Manufactured Homes, and Free Standing property sectors outperformed in rising (3/1/2009 to 6/30/2016) and declining real estate (2/1/2007 to 2/28/2009).

Finally, we demonstrated that the optimized portfolio had higher performance for the level of risk in expanding and contracting economic environments as well as rising and declining real estate environments. The results for the optimized portfolio allocated to the Self Storage, Manufactured Homes, and Free Standing property sectors is consistent with our observations, as these sectors outperformed in the economic and market environments reviewed.

While the findings and performance improvement demonstrated through the research process are significant during the time period reviewed, we believe that additional REIT property sector performance data and time will be necessary. Typically, we prefer that an extended period of study is available to ensure that the performance analysis of the portfolio is significant over multiple market cycles. As such, we will continue to conduct research in an attempt to improve real estate diversification and performance.

## REFERENCES

- FTSE Russell. *Fact Sheet – FTSE NAREIT ALL Equity REITs Index*. FTSE Russell. November 30, 2016. Web. Retrieved from <http://www.ftse.com/analytics/factsheets/Home/>. Accessed December 20, 2016.
- Leon, Kenneth. *Industry Surveys – Real Estate Investment Trusts*. CFRA Research – S&P Global. December 2016.
- Persin, Susan. *Manufactured Housing Leads 2015 REIT Sector Performance*. Urban Land – The Magazine of the Urban Land Institute. July 27, 2015. Retrieved from <http://urbanland.uli.org/news/manufactured-housing-leads-2015-reit-sector-performance/>. Accessed December 20, 2016.
- Persin, Susan. *Freestanding Retail REITs Bring Stable Returns in Uncertain Times*. Urban Land – The Magazine of the Urban Land Institute. July 11, 2016. Retrieved from <http://urbanland.uli.org/news/freestanding-retail-reits-bring-stable-returns-uncertain-times/>. Accessed December 20, 2016.

## APPENDIX 1 – PERFORMANCE OF MARKETABLE REIT PROPERTY SECTOR INDICES



<i>Appendix 1</i>	<i>Total Return (07/01/2006 to 06/30/2016)</i>	<i>Standard Deviation (07/01/2006 to 06/30/2016)</i>	<i>Sharpe Ratio (07/01/2006 to 06/30/2016)</i>
FTSE NAREIT All Equity REITs TR USD	7.45	25.39	0.38
FTSE NAREIT Eqty Apartments TR	9.06	25.34	0.44
FTSE NAREIT Eqty Diversified TR	4.97	27.44	0.28
FTSE NAREIT Eqty Free Standing TR	14.40	21.67	0.69
FTSE NAREIT Eqty Health Care TR	12.60	25.66	0.56
FTSE NAREIT Eqty Industrial TR	0.52	42.63	0.22
FTSE NAREIT Eqty Lodging/Resorts TR	0.35	38.21	0.17
FTSE NAREIT Eqty Manufactured Homes TR	15.20	22.36	0.71
FTSE NAREIT Eqty Office TR	4.34	27.12	0.26
FTSE NAREIT Eqty Regional Malls TR	7.49	34.51	0.36
FTSE NAREIT Eqty Residential TR	9.51	24.96	0.46
FTSE NAREIT Eqty Retail TR	7.22	29.80	0.36
FTSE NAREIT Eqty Self Storage TR	16.99	23.79	0.74
FTSE NAREIT Eqty Shopping Centers TR	5.11	29.39	0.29
FTSE NAREIT Equity Specialty TR USD			
FTSE NAREIT Timber REITs TR USD			
FTSE NAREIT Eqty Data Centers			
FTSE NAREIT Eqty Infrastructure REITs			
FTSE NAREIT Eqty Single Family Homes			

## APPENDIX 2 – ASSET ALLOCATION FOR THE OPTIMIZED REIT PROPERTY SECTOR INDICES PORTFOLIO

<i>Appendix 2</i>	<i>Optimized REIT Property Sector Indices Model</i>
FTSE NAREIT Eqty Apartments TR	0.00%
FTSE NAREIT Eqty Diversified TR	0.00%
FTSE NAREIT Eqty Free Standing TR	27.00%
FTSE NAREIT Eqty Health Care TR	0.00%
FTSE NAREIT Eqty Industrial TR	0.00%
FTSE NAREIT Eqty Lodging/Resorts TR	0.00%
FTSE NAREIT Eqty Manufactured Homes TR	34.00%
FTSE NAREIT Eqty Office TR	0.00%
FTSE NAREIT Eqty Regional Malls TR	0.00%
FTSE NAREIT Eqty Residential TR	0.00%
FTSE NAREIT Eqty Retail TR	0.00%
FTSE NAREIT Eqty Self Storage TR	39.00%
FTSE NAREIT Eqty Shopping Centers TR	0.00%
FTSE NAREIT Equity Specialty TR USD	0.00%
FTSE NAREIT Timber REITs TR USD	0.00%
FTSE NAREIT Eqty Data Centers	0.00%
FTSE NAREIT Eqty Infrastructure REITs	0.00%
FTSE NAREIT Eqty Single Family Homes	0.00%
<b>Total</b>	<b>100.00%</b>

*Washington Trust Bank Wealth Management & Advisory Services*

Washington Trust Bank believes that the information used in this study was obtained from reliable sources, but we do not guarantee its accuracy. Neither the information nor any opinion expressed constitutes a solicitation for business or a recommendation for the purchase or sale of securities or commodities.



## APPENDIX 3 - DEFINITION OF TERMS

- **Total return** is a measure of return over time, combining both asset appreciation and income.
- **Standard deviation** is a measure of risk which shows the dispersion of returns to the mean.
- The **Sharpe ratio** is a measure of risk-adjusted return calculated by dividing the average portfolio excess return (to the risk-free rate) by the standard deviation over time.

## APPENDIX 4 – ADDITIONAL INFORMATION ON STUDY METHODOLOGY

- REIT property sector indices were used in this study as they appropriately represent real estate performance, but do not reflect investment manager bias.
- The period of review for this study was 7/1/2006 through 6/30/2016 due to availability of data.
- The optimized REIT property sector indices portfolio was rebalanced once a year to target weights (on a rolling calendar basis).
- The study assumes that an investor was invested in the indices and portfolio for the full time period studied.