

Research Report

The Case for Listed Real Estate

October 2013

Passion to Perform

For institutional advisory and registered representative use only, not for public viewing or distribution.



Prepared By:

Alex Symes
Vice President
Economic & Quantitative Analysis
alex.symes@db.com

Jaimala Patel
Vice President
Quantitative Strategy
jaimala.patel@db.com

Mark G. Roberts
Managing Director
Head of Research & Strategy
mark-g.roberts@db.com

Table of Contents

Executive Summary	1
Listed real estate	1
Listed and non-listed real estate	2
Listed real estate in a multi-asset context	4
Income	4
Risk and return.....	6
Correlations.....	7
The asset-class universe	8
Mean-variance analysis	9
Conclusion	12
Appendix I: Asset class proxies	13
Appendix II: The modern REIT era.	13
Important Notes.....	15
Research & Strategy Team – Alternatives and Real Assets.....	16

Executive Summary

- **Real estate provides investors with the potential for attractive risk-adjusted returns and yields, low correlations to other asset classes and the potential for moderate, long-term capital appreciation.**
- **Listed real estate investments enable investors to include real estate in their portfolios with greater liquidity, lower transaction costs, and smaller initial investments than buying property directly.**
- **REITs can be complementary to private real estate, allowing investors to manage sector rebalancing without selling individual properties and to maintain higher levels of liquidity while accessing similar long-term cash flow profiles.**
- **Investors can potentially benefit from allocations to both private and public real estate within a multi-asset portfolio.**
- **An investor with a higher risk-tolerance has the potential to achieve higher returns and lower volatility by adding listed real estate to a multi-asset portfolio.**

Institutional investors are increasingly looking to real estate as an investment option; the asset class has typically provided attractive risk-adjusted returns, a cash flow stream that can be matched to liabilities, a hedge to inflation, attractive yields, and low correlations to other asset classes. Real estate can be viewed as a hybrid asset class that combines stock-like appreciation and bond-like yields. However, despite its similarities to certain attributes of both stocks and bonds, the risk/return profile of real estate cannot be replicated synthetically, making real estate a unique asset class.

Investors can access the real estate asset class through publicly-traded REITs. Listed REITs provide access to similar underlying assets and associated cash flows as private real estate investments, but with greater liquidity and lower costs. However, the higher liquidity and lower costs associated with listed real estate can result with the asset class having higher return volatility than non-listed investments, as well as reduced control on individual real estate properties. Due to these differences, in the short run listed (indirect) and non-listed (direct) real estate can act as complement investments, even though the two investment structures have similar underlying assets.

In this paper, we explore the impact of an allocation to listed real estate on a multi-asset class portfolio from a risk and return perspective. The first section gives an introduction to REITs and compares the attributes of listed and non-listed real estate. In the second section, we look at the effects of including listed real estate in a multi-asset class portfolio. The results of the mean-variance optimization analysis suggest that investors can increase returns and/or reduce return volatility by adding REITs to a multi-asset portfolio.

Listed real estate

Listed equity real estate investment trusts, or REITs, are publicly-traded companies that invest in income-producing real estate on behalf of investors. REITs are commonly operated by internal management companies, which make real estate and financial decisions on behalf of investors. Public REITs typically invest in only one property type and/or region, allowing active investors to tailor REIT stock allocations to their own expectations of market performance by sector and geography, and investment preferences.

An important difference between REITs and other exchange-listed companies is the treatment of taxes. REITs are able to deduct dividend payments from income, potentially lowering effective tax rates to zero as long as certain requirements are met. REITs are obligated to have at least 75% of their investments in real estate (as either equity or debt), to have 75% of income derived from either rents or mortgage interest, and to distribute at least 90% of profits to investors annually.¹ The intent of the tax structure is to give investors access to real estate through public markets and funds without causing a double-taxation of income, putting public real estate on a relatively level playing field in terms of taxation with direct real estate.

In the United States, equity REIT returns are represented by the FTSE NAREIT All Equity REITs Index (hereinafter referred to as NAREIT), which as of fourth quarter 2012, was composed of 139 REITs with a market capitalization of \$544 billion.² The members of the NAREIT index are diverse both in size, ranging from \$150 million to over \$50 billion, and in type of underlying assets, which can include standard property types, such as office buildings or warehouses, or more specialized real estate types, such as manufactured homes and prisons. Note that recently several timber and cell phone tower companies chose to convert from c-corporations to REITs, but the addition of these companies has had little effect on the index.³

Listed and non-listed real estate

Investors with multi-asset class portfolios typically place publicly-traded and private real estate under the same allocation. The underlying assets and cash flow profiles of direct and indirect real estate are the similar, so including them both under a single 'real estate' allocation seems sensible.⁴ However, there are nuances between the two structures that make them closer to complements over the short-run rather than substitutes, and so investors could gain by having both in a portfolio.

Direct ownership in properties provides investors control over asset-level decisions and the ability to affect asset performance directly. Investors looking to match cash flow with liabilities can choose the specific property type and lease structure to meet portfolio needs. Additionally, direct investors are able to control the management and financing of each individual deal, increasing transparency and flexibility with respect to property management. However, while direct investors have more control over individual assets, transaction costs are expensive and investments are less liquid than listed investments, mak-

Listed and non-listed real estate		
Asset Characteristic	Listed	Non-listed
Access to Direct Real Estate	✘	✓✓
Scope for Portfolio Diversification	✓✓	✓
Volatility	✘	✓✓
Liquidity	✓✓	✘
Yield	✓	✓✓
Transparency	✓✓	✘
Access to Expert Real Estate Managers	✓✓	✓
Costs of Asset Management	✓✓	✘
Costs of Trading	✓✓	✘
Ease of Implementation	✓✓	✘
	✓ Significant Strength	✓ Some Strength ✘ No Advantages

Sources: Deutsche Asset & Wealth Management.
As of October 2013.

¹ The taxation rules for REITs are found in IRS section 856.

² While there are both private REITs and public mortgage REITs, in this paper we will use the term "REITs" only in reference of public equity REITs.

³ See [the FTSE FACTSHEET](#) for more information.

⁴ Stephen Lee & Simon Stevenson, 2004. "The Case for REITs in the Mixed-Asset Portfolio in the Short and Long Run," Real Estate & Planning Working Papers rep-wp2004-06, Henley Business School, Reading University.

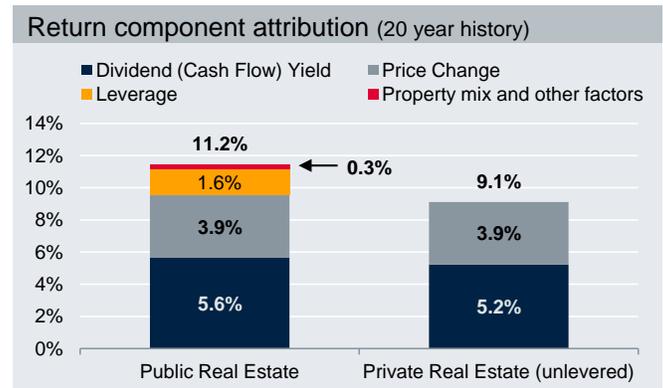
ing it difficult to rapidly reshape the portfolio of assets. Additionally, controlling asset specific decisions requires having the skills necessary to manage properties and create value.

Listed real estate investors do not have control over property-level decisions, but gain several advantages over direct investments. As REITs are listed on public exchanges, investments are highly liquid and transaction costs are low. While REITs pay similar amounts as private investors for property brokerage, these costs are internalized on the General and Administrative (G&A) expenses and listed real estate investors pay similar transaction costs as other listed equity investors on trades. Additionally, required investment lot sizes for listed real estate are much lower than for direct investment; this allows small investors to have equity exposure to multiple large real estate assets (e.g. regional malls), while still having enough capital to be diversified within the sector.

Listed real estate comes with a management team. While direct investments are managed either by the investor or by a third-party company, the modern REIT is managed internally by an operating company. Property-level and financing decisions are made by the REIT management, whose skill is valued by the market. Internal management may raise overall investment costs, but it aligns the interests of the manager with the investors, which can reduce risk and increase returns. High-quality management teams can add substantial value to the underlying assets, which can be measured by the share price premium (or discount) to the value of the underlying assets. According to data constructed separately by both Green Street Advisors and Deutsche Asset & Wealth Management, from 1990 to 2012, U.S. REITs traded at an average of 2% to 3% above net assets.

Both public and private real estate investments use leverage, but REITs tend to carry higher debt loads. Listed real estate companies have access to more avenues of financing than non-listed, often leading to lower capital costs. Public companies can add to capitalization by issuing additional equity to the market, or by accessing the public or private debt markets depending on market conditions. Lower capital costs allow leverage for listed real estate to be accretive a higher debt level. The REIT market overall typically has debt-to-asset value ratios between 35% and 45%, higher than comparable private real estate funds, which have loan-to-values ranging between 15% to 25% in normal market conditions⁵.

As the underlying assets and cash flow profiles of direct and indirect real estate are similar, returns over the long term are co-integrated, with similar long-term performance. The chart to the right illustrates the decomposition of returns of both REITs and private real estate by return source. We find that total returns from both investment types are composed almost equally of income yield and price appreciation. However, REIT appreciation is boosted by leverage and other factors, such as property type



For illustrative purposes only; past performance is not a guarantee of future results.
Sources: NAREIT, NCREIF Transaction-Based Index and Deutsche Asset & Wealth Management.
As of October 2013. Data ending fourth quarter 2012.

⁵ Public market leverage estimate is from NAREIT and Deutsche Asset & Wealth Management; private market leverage estimate is from NCREIF NFI-ODCE index.

mix. The final result is that REITs have had historically higher long-term returns than private real estate, but outperformance was due to differences in capital structure and leverage and property mix⁶ rather than the underlying assets. Thus, outside of these differences, listed and non-listed real estate should have similar long-term performance. Including listed and non-listed real estate in the same allocation is logical as they have similar long-term performance characteristics.

Listed real estate in a multi-asset context

Listed real estate has provided accretive risk-adjusted returns with high current yields, while contributing to portfolio diversification and delivering attractive total returns.⁷ Due to the income distribution requirement, REITs historically have had high dividend yields compared to stocks and bonds. Additionally, as real estate has mild correlation with stocks and low correlation with bonds, a real estate allocation can increase portfolio diversification.⁸

Income

Listed real estate has generally provided investors with high income yields compared to common stocks. As REITs are required to distribute 90% of profits to investors annually, the return profile is skewed more heavily towards yield compared to other listed investments. While both have similar earnings yields, common stocks are able to retain earnings resulting in lower dividend yields. The differences in distribution patterns result in divergent long-term return profiles. The following two charts show cumulative returns after 20 years of real estate and broad equities, assuming income reinvestment. The charts show that listed real estate has slightly lower price appreciation than stocks, but much higher income return.



Note: Assumes dividend reinvestment. Past performance is not a guarantee of future results.

Sources: Ibbotson EnCorr, S&P, NAREIT, Deutsche Asset & Wealth Management.

As of September 2013. Data ending fourth quarter 2012.

⁶ The NAREIT Index has higher exposure to regional malls and self-storage than the NCREIF Property Index. These property types have outperformed from 2010 to 2012.

⁷ Past performance is not necessarily a guarantee of future results.

⁸ Increased portfolio diversification does not assure a portfolio against market loss.

Price and income return (10 year periods)

	1993 to 2002		2003 to 2012	
	Price Return	Dividend Yield	Price Return	Dividend Yield
NAREIT Index	10.5%	7.2%	11.8%	4.9%
S&P 500	9.3%	1.9%	7.1%	2.1%

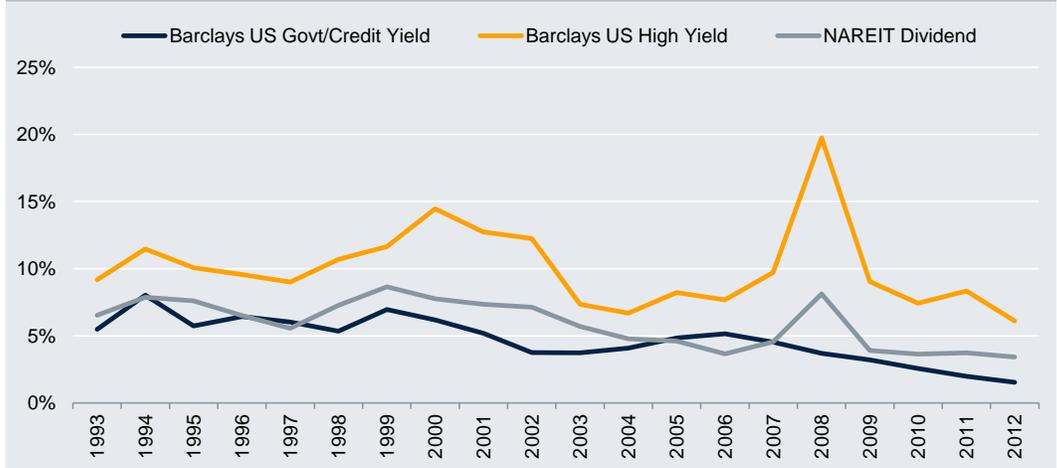
Note: Assumes dividend reinvestment. Past performance is not a guarantee of future results.

Sources: Ibbotson EnCorr, S&P, NAREIT, Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

Based on historically high dividend yields, REITs have an income profile close to that of fixed income. From 1993 to 2012, REIT dividends had a 100 basis point premium over domestic bonds, although the spread fluctuated with credit and business cycles. While REITs provide a premium over bonds, spreads can become inverted when investor appetite for real estate grows. Spread inversion occurred three times during the past 20 years – in 1994 and 1997 during the first and second wave of REIT public offerings, and during the real estate boom in the late 2000s when real estate and equity markets were outperforming bond returns.

Bonds vs. Dividend Yield



For illustrative purposes only.

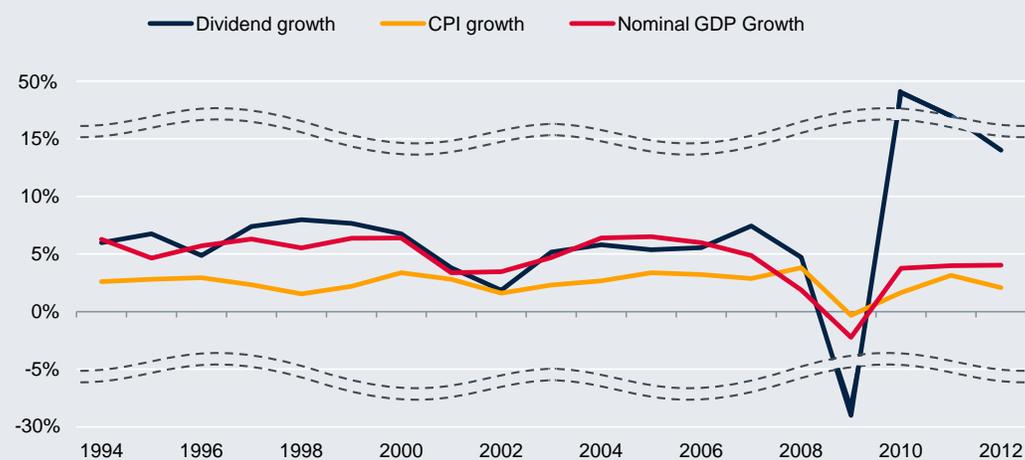
Source: Barclays, NAREIT and Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

In addition to providing high current yields, REIT income has historically grown in excess of inflation. Real estate income comes from property rents, which are included in the reported consumer or producer price inflation indices, so there is a natural correlation between the two. Additionally, during times of high inflation, owners tend to include provisions for inflation-based rent increases to ensure that property income maintains pace with rising price levels. As income growth is capitalized in property values, REITs historically have been able to provide investors with a partial hedge on inflation.

Investors can get additional inflation protection from dividend growth. Due to operational and financial leverage, as well as income reinvestment in the property, dividends historically have grown in excess of inflation and close to the level of U.S. nominal GDP growth.

Dividend growth compared to inflation



For illustrative purposes only.

Source: NAREIT, BLS and Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

Risk and return

Listed real estate outperformed other asset classes during the past decade, although with higher volatility. However, this return volatility is often out of sync with large cap stock volatility, providing portfolio diversification and lower total portfolio risk. Listed real estate outperformed all other asset classes both on a ten-year and twenty-year returns basis, ending in fourth quarter 2012. However, due to higher volatility, it only outperformed large cap, small cap and international stocks and cash as measured by the Sharpe ratio.

Asset Return and Risk Profiles⁹

Asset Class	10 Year (2003 to 2012)			20 Year (1993 to 2012)		
	Return	Standard Deviation	Sharpe Ratio	Return	Standard Deviation	Sharpe Ratio
Public REITs	11.8	29.9	0.25	11.2	23.3	0.24
Private Real Estate	5.7	9.3	0.25	7.0	6.9	0.31
Large Cap Stocks	7.1	18.0	0.20	8.2	18.1	0.19
International Stocks	8.7	23.4	0.21	6.5	20.4	0.14
Small Cap Stocks	9.7	23.8	0.23	8.4	22.7	0.18
Domestic Bonds	5.2	4.5	0.42	6.4	4.7	0.38
International Bonds	6.0	6.1	0.37	6.3	6.2	0.29
Cash	1.6	0.9	0.00	3.0	1.1	0.00
Domestic Inflation	2.4	1.8	N/A	2.5	1.3	N/A

For illustrative purposes only; past performance is not a guarantee of future results.

Source: Ibbotson Encorr, S&P, MSCI, Russell, NAREIT, NCREIF, and Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

As the underlying assets of REITs and private real estate share similar characteristics, the increased return and volatility of REITs are likely related to the capital structure and leverage levels. As previously indicated, listed real estate is valued daily using transactions, while the

⁹ See the appendix for a list of indices that proxy each asset class.

private real estate index used in this analysis is appraisal-based. Appraisal-based valuations tend to lag the transaction market, and can miss some temporary drawdowns, masking market volatility. Additionally, the private index that we are using, the NFI-ODCE, had an average loan-to-value (LTV) of 22% since 2000, which is much lower than 39% LTV of public REITs and reduced private real estate return volatility.

Correlations

Investors can reduce portfolio volatility per unit of return by investing in asset classes that move independently of one another. Modern portfolio theory suggests that diversification into asset classes with low correlations will reduce overall portfolio risk. As listed real estate historically has had mild to low correlation with other asset classes, investors can reduce portfolio volatility by adding a REIT allocation to a portfolio of stocks and bonds.

Though both provide investors with high current yields, public real estate has little correlation with fixed income. Bond return volatility comes from fluctuations in interest rate, and fixed income assets will appreciate as interest rates fall. While real estate can benefit from lower bond yields, due to cheaper debt as well as income yield compression, real estate equity also appreciates with rising rents and falling vacancy, which do not necessarily correlate with the credit cycle. Investors can use listed real estate as a diversifier for fixed-income investments as drivers of return differ between the two asset classes.

Listed real estate is more correlated to stocks than other sectors, but demand drivers of real estate and the broad stock market differ enough to give investors diversification. While stock market profits begin to decline at the end of a business cycle, properties with long-term leases are typically able to ensure that incomes remain stable. Income profiles out of sync with other sectors enable investors to gain diversification by investing listed real estate.¹⁰ While both stocks and listed real estate are relatively correlated, any correlation less than 1.0 can provide investors with the benefit of diversification.

Investors can further diversify within the real estate asset class by allocating to both listed and non-listed real estate. By investing in both public and private real estate, investors are able to diversify capital market exposure, and maintain a balance between liquidity and asset control. However, diversification benefits are likely to be stronger in the short run, as the two types of real estate investment behave similarly in the long run.

It should be noted, however, that one reason for lower correlations between listed and non-listed real estate is due to differences in valuation methods. Listed real estate assets are valued daily, with market pricing, while non-listed investments are valued with annual or quarterly appraisals. By lagging listed real estate returns by four quarters, we find that the correlation between the two types of real estate investments is around 0.56, higher than what is reported in the correlations table.

¹⁰ It should be noted that correlation between stocks and listed real estate may be mildly overstated as the proxy indices for both large cap and small cap stocks contain equity REITs, representing close to 2% and 9% of value, respectively.

Total return correlations (1993 to 2012)

	Public REITs	Private Real Estate	Large Cap Stocks	International Stocks	Small Cap Stocks	Domestic Bonds	International Bonds	Cash	Domestic Inflation
Public REITs	1.00								
Private Real Estate	0.18	1.00							
Large Cap Stocks	0.58	0.18	1.00						
International Stocks	0.56	0.09	0.85	1.00					
Small Cap Stocks	0.68	0.12	0.90	0.81	1.00				
Domestic Bonds	0.01	-0.07	-0.22	-0.23	-0.27	1.00			
International Bonds	0.15	-0.06	-0.01	0.14	-0.09	0.71	1.00		
Cash	-0.05	0.34	0.07	-0.03	-0.03	0.10	-0.02	1.00	
Domestic Inflation ¹¹	0.27	0.32	0.16	0.16	0.17	-0.32	-0.12	0.15	1.00

Past performance is not a guarantee of future results.

Source: NCREIF, NAREIT, S&P, MSCI, Russell, Barclays, BLS, Federal Reserve, Morningstar EnCorr and Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

The asset-class universe

To demonstrate the benefits of adding listed real estate to a multi-asset class portfolio from the perspective of a U.S. based investor, we performed mean-variance optimization using historic returns and resampling methods. The asset classes used in the following analysis are private real estate, public REITs, large cap stocks, small cap stocks, international stocks, domestic bonds and international bonds, as well as cash.¹² The table below highlights the market size of each asset class and sets a neutral portfolio based on total capitalization.

Investable universe and portfolio attributes

Asset Class	Market Size	Neutral Portfolio	Minimum Allocation	Maximum Allocation ¹³
Public REITs	\$544 billion	1.1%	0%	20%
Private Real Estate	\$1,462 billion	2.9%	0%	20%
Large Cap Stocks	\$13,898 billion	27.6%	20%	80%
International Stocks	\$11,356 billion	22.6%	0%	20%
Small Cap Stocks	\$1,100 billion	2.2%	0%	20%
Domestic Bonds	\$8,280 billion	16.5%	20%	80%
International Bonds	\$13,191 billion	26.2%	0%	20%
Cash	\$480 billion	0.9%	0.2%	5%

Note: Market size may be larger than the market capitalization of the proxy index as the index may not be of the investible universe for each asset class.

For illustrative purposes only.

Source: DTZ, S&P, MSCI, Russell, Barclays, Treasury Direct and Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

With respect to the neutral portfolio and the market capitalization, we choose to constrain each asset class in a modeled portfolio for a few reasons. First, we are using historic data for a given period, and while we believe this period to be representative of future returns, it may contain outliers that would cause an unjustified over- or under-allocation to certain asset clas-

¹¹ As measured by US CPI-U (SA)

¹² See the appendix for a list of indices that proxy each asset class.

¹³ Additional constraints were made on the broad asset classes: 80% max for all stocks, 80% max for all bonds, and 20% max for all real estate.

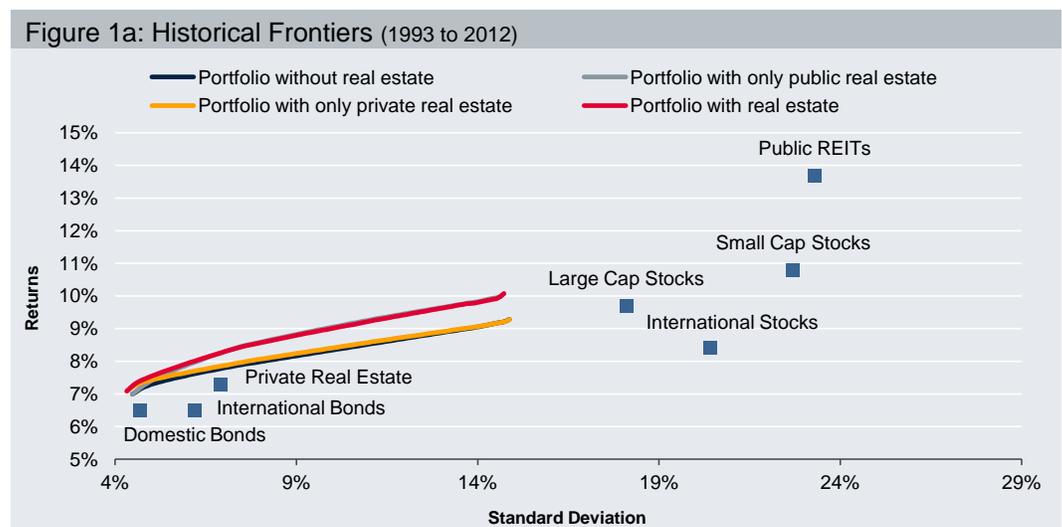
ses. Additionally, modern portfolio theory suggests that diversification reduces risk to a portfolio, especially when allocating to asset classes with low correlations to each other. It is possible for mean-variance analysis to suggest only investing in one asset class, but an investor would then lose the benefits of diversification. Manual portfolio constraints will prevent the analysis from suggesting investors allocate to only one asset class. Lastly, the portfolio is constrained loosely with respect to the neutral portfolio to prevent an unrealistically high allocation weights to small asset classes. The total market capitalization of the equity REIT sector was \$544 billion in fourth quarter 2012. Accordingly, if the model suggested that a plan sponsor with \$25 billion in assets allocate 50% of the portfolio to REITs, the plan would need to invest in 2% of the entire market capitalization. Since the REIT sector is relatively small compared to broad equities and bonds, an investor attempting to invest \$12.5 billion in REITs would struggle to receive some of the benefits of listed real estate, namely liquidity and transaction costs.

Although the neutral portfolio is not too far from the average distribution of assets of institutional investors¹⁴, we are giving our constraints substantial leeway to over or under allocate to certain asset classes. While we want to show realistic portfolio allocations for institutional investors, we also want to push the boundaries to demonstrate the advantages and disadvantages to REIT exposure compared to other asset classes.

Mean-variance analysis

Using the asset class universe from the previous section, we can examine the role of listed real estate in a multi-asset class portfolio using mean-variance optimization on historical data from 1993 to 2012. The results are four potential Capital Asset Pricing Model (CAPM) efficient frontiers: one without real estate, one each containing only public or private real estate, and one with both public and private real estate.

In the following two charts, we present the results of the optimization in two figures. Figure 1a shows the frontier along with all asset classes, and Figure 1b is an enlarged view of the same exhibit, but focused on the left side of the frontiers for easier dissection.



¹⁴ According to a Tower Watson study published in October 2012, average distribution was approximately 47% equities, 38% stocks, 1.8% real estate, 3.6% cash and the remainder other alternatives.

Figure 1b: Historical Frontiers (1/5 scale)



For illustrative purposes only. No assurance can be made that future investments will achieve similar returns.

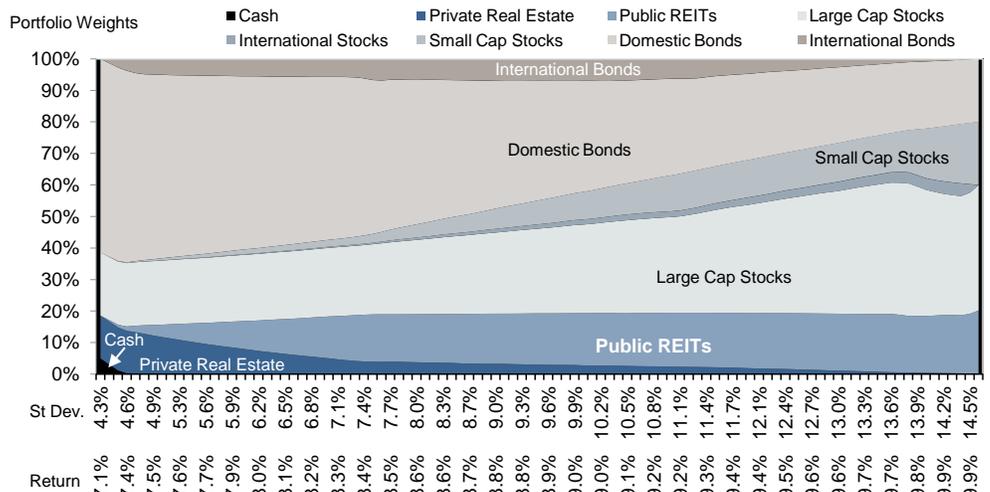
Source: Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

In the lowest frontier (blue) we show the optimization without real estate, and with the other three frontiers we include both/either listed and/or non-listed real estate. As the frontiers with real estate are generally higher than the blue line, we can see that investors can increase returns and reduce volatility by adding an allocation to real estate.

Looking at an allocation area chart of a portfolio with both listed and non-listed real estate (below), we can see that the optimization analysis suggests that an investor should always be overweight to real estate with respect to the neutral portfolio. However, the mix between listed and non-listed real estate varies depending on an investor's risk tolerance. A conservative investor accepting average portfolio volatility of only 4.5% would invest primarily in private real estate, but still could benefit from a small allocation to REITs. At this level of risk tolerance, an investor looking to add real estate to a portfolio for the first time will likely replace a portion of the bond allocation with real estate.

Asset allocation area graph for frontier with listed and non-listed real estate



This information is a forecast and due to a variety of uncertainties, and assumptions made in our analysis, actual events or results or the actual performance of the markets covered may differ from those presented.

Source: Deutsche Asset & Wealth Management.

As of October 2013. Data ending fourth quarter 2012.

An investor with a moderate risk tolerance would have a higher allocation to public real estate and a lower allocation to private real estate. As REITs generally use higher leverage than non-listed core real estate, investors willing to accept higher volatility will likely shift allocations from private to public real estate. The overall allocation to real estate would increase from around 15% to 19%, nearing the constraint of 20% established in the previous section. The stock allocation remains low, near 30% of total assets, compared to the neutral portfolio of 52%.

Mean-variance allocation results (1993 to 2012)				
Asset Class	Neutral Portfolio	Conservative	Moderate	Aggressive
		4.5% SD	8.5% SD	12.5% SD
Public REITs	1.1%	0.8%	15.5%	17.8%
Private Real Estate	2.9%	13.7%	3.1%	1.3%
Large Cap Stocks	27.6%	20.0%	24.5%	37.9%
International Stocks	22.6%	0.0%	1.3%	2.3%
Small Cap Stocks	2.2%	0.1%	4.9%	11.4%
Domestic Bonds	16.5%	60.0%	43.3%	25.6%
International Bonds	26.2%	4.2%	7.2%	3.5%
Cash	0.9%	1.3%	0.2%	0.2%
Expected Return	8.0%	7.3%	8.7%	9.5%
Standard Deviation	9.9%	4.5%	8.5%	12.5%
Sharpe Ratio	0.8	1.6	1.0	0.8

Source: DTZ, S&P, MSCI, Russell, Barclay's, Treasury Direct and Deutsche Asset & Wealth Management.
As of October 2013. Data ending fourth quarter 2012.

An investor with higher risk tolerance would move further into public real estate, as well as both small and large cap equities, reducing exposure further away from private real estate and bonds. Allocation to real estate is at the high end of our constraint at 19%. Total allocation to stocks reaches 51%, which is the highest of all sectors, but still well below the 80% maximum constraint established for the model portfolio. An investor starting without an allocation to real estate would likely move capital out of stocks, both small cap and large cap, and into listed real estate.

The efficient frontier analysis suggested that an investor looking to have the same volatility as the neutral portfolio could outperform by having a large overweight to listed real estate. From 1993 to 2012, the neutral portfolio had a standard deviation of 9.9% and a return of 8.0%. By reducing stock holdings and overweighting to real estate, the model portfolio suggests that an investor has potential for over 100 basis point increase in returns, while maintaining a standard deviation of 9.9%.

Conclusion

Real estate provides investors with several major advantages including attractive risk-adjusted returns, relatively high yields, low correlations to other asset classes, and the potential for moderate, long-term capital appreciation. The variation through time in correlations of REITs with other investment vehicles shows that investors should consider REITs to comprise their own unique asset class. Most importantly for the portfolio investor, adding an allocation to real estate may reduce volatility and increase overall portfolio returns.

REIT investment is appropriate and recommended for a wide spectrum of investors. A REIT allocation provides access to similar cash flow profiles as direct real estate while reducing liquidity risk and transaction costs. Listed real estate complements a direct real estate allocation in the short run given differences between the two investment structures. However, over the long run, small institutional and retail investors that are unable to properly invest in direct real estate can use listed REITs as their full real estate allocation, as the two structures perform similarly over a long horizon.

Appendix I: Asset class proxies

Asset Class	Index proxy
Public REITs	FTSE NAREIT All Equity REITs Total Return
Private Real Estate	NFI-ODCE Net Total Return
Large Cap Stocks	S&P 500 Total Return
International Stocks	MSCI EAFE Total Return
Small Cap Stocks	Russell 2000 Total Return
Domestic Bonds	Barclay's (U.S) Government/Credit Total Return
International Bonds	Barclay's Global Aggregate Total Return
Cash	30 Day Treasury Bills provide by Ibbotson Associates

Sources: DTZ, S&P500, MSCI, Russell, Barclay's, Treasury Direct and Deutsche Asset & Wealth Management.
As of October 2013.

Appendix II: The modern REIT era.

Real estate practitioners often cite the early 1990s as the beginning of the modern REIT era as there were a number of factors that moved the sector from a niche investment style into a unique asset class. Changes were made in the 1980s and early 1990s to the original REIT structure that was first established in 1960, which aligned the interests of the investors with managers, put the tax structure on a more level playing field with other private real estate funds, and created greater opportunity for pension funds to invest in the sector.

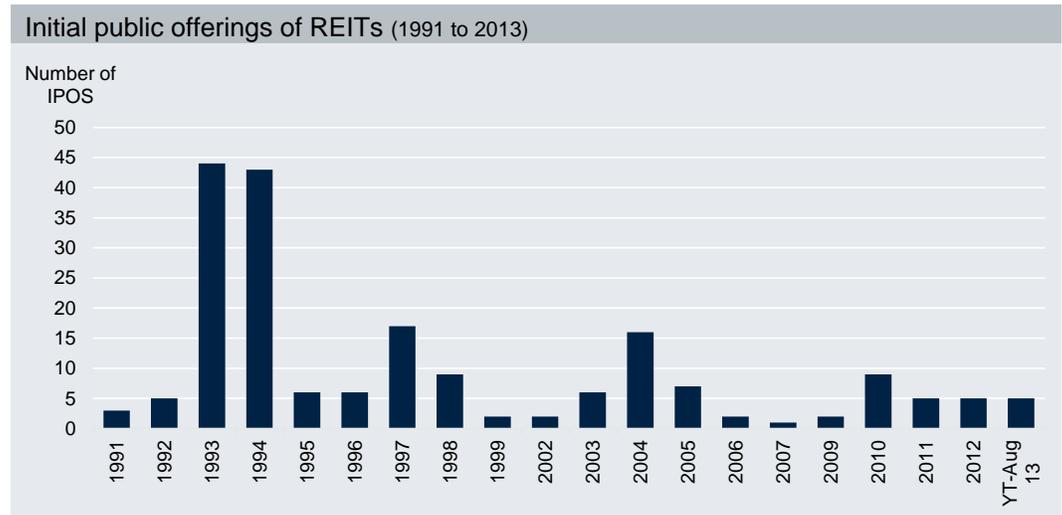
The original REIT legislation permitted companies to own properties on behalf of many investors without higher taxes relative to direct ownership; however, it did not allow REITs to have internal management. Investors were forced to outsource real estate services to a third party, which added management costs and reduced the alignment of interests between investors and managers¹⁵. Additionally, REITs were at a disadvantage in terms of tax treatment against limited partnerships, discouraging investors from using the structure.

The Tax-Reform Act of 1986 helped decrease some of the competitive disadvantages REITs had compared to private funds. By reducing tax benefits afforded to private real estate funds, listed real estate was on a more equal playing field. Additionally, the same law gave REITs the ability to have internal management. The success of the manager was now dependant on the success of the REIT, better aligning the investor interests with the REIT administrators. Listed real estate was now on a more equal footing with private real estate funds⁸.

The final major change to REIT regulation came in 1993 with regards to the "five or fewer" requirement. The original intent of the REIT structure was to provide real estate exposure to a large number of investors. To ensure that each REIT was held widely, a rule was created stating that five or fewer investors could not hold over 50% of assets, and that each REIT must have at least 100 investors. As pension funds are large investors, and many REITs at the time were small, pension funds were not able to become meaningful investors in the sector without at times having large positions in individual REITs. Five pension funds holding 10% of a REIT would break the five or fewer rule. However, since pension funds themselves are widely held, congress added a provision that the rule could look-through the fund to count the individual

¹⁵ Wishire. The Role of REITs and Listed Real Estate Equities in Target Date Fund Asset Allocations. Santa Monica, California, March 2012.

beneficiaries instead. The easing of the five or fewer requirement greatly increased the potential capital that could be allocated to the REIT space.¹⁶



Source: NAREIT and Deutsche Asset & Wealth Management.
As of September 2013.

The real estate cycle helped REITs grow in terms of assets under management in the 1990s. The 1980s construction boom came to a close with a credit crunch in the early 1990s, putting many private real estate funds in distress. However, the distress in the private market aided the rapid development of the public market. While traditional sources for capital were closed to distressed funds, the public equity markets were still functioning. Securitization became an option. By taking private real estate funds public, companies were able to use the proceeds to reduce leverage levels, stabilizing the new REIT. This became a popular form of refinancing, and led to a boom in securitization. In 1993 and 1994, 87 companies became publicly listed equity REITs raising \$15 billion of fresh capital, the most ever during a two-year period. With a larger number of listed REITs, the investor appetite for the sector increased. While the broad equity market was still struggling from the downturn, formerly-distressed real estate companies were now stabilized and looking for opportunities to expand.

Changes in regulations put REITs on a level playing field with private funds and an increased number of listed companies, moving the sector from a niche investment opportunity to a mature asset class. After 1992, the correlation between REITs and stocks declined and the integration between public and private real estate strengthened, confirming that REITs belonged in a unique asset class.¹⁷

¹⁶REIT Industry Timeline: Celebrating 50 years of REITs and NAREIT. November 2010. <http://www.reit.com/timeline/timeline.php> (accessed March 5, 2013).

¹⁷ Clayton, Jim, and Greg MacKinnon. "REIT, Real Estate and Financial Asset Returns." *Journal of Real Estate Portfolio Management*, 2001: 43-53.

Important Notes

Deutsche Asset & Wealth Management represents the asset management and wealth management activities conducted by Deutsche Bank AG or any of its subsidiaries. Clients will be provided Deutsche Asset & Wealth Management products or services by one or more legal entities that will be identified to clients pursuant to the contracts, agreements, offering materials or other documentation relevant to such products or services. In the U.S., Deutsche Asset & Wealth Management relates to the asset management activities of RREEF America L.L.C.; in Germany: RREEF Investment GmbH, RREEF Management GmbH, and RREEF Spezial Invest GmbH; in Australia: Deutsche Australia Limited (ABN 37 006 385 593) an Australian financial services license holder; in Japan: Deutsche Securities Inc. (For DSI, financial advisory (not investment advisory) and distribution services only); in Hong Kong: Deutsche Bank Aktiengesellschaft, Hong Kong Branch (for direct real estate business), and Deutsche Asset Management (Hong Kong) Limited (for real estate securities business); in Singapore: Deutsche Asset Management (Asia) Limited (Company Reg. No. 198701485N); in the United Kingdom: Deutsche Alternative Asset Management (UK) Limited, Deutsche Alternative Asset Management (Global) Limited and Deutsche Asset Management (UK) Limited; in Italy: RREEF Fondimmobiliari SGR S.p.A.; and in Denmark, Finland, Norway and Sweden: Deutsche Alternative Asset Management (UK) Limited and Deutsche Alternative Asset Management (Global) Limited; in addition to other regional entities in the Deutsche Bank Group.

Key Deutsche Asset & Wealth Management research personnel are voting members of various investment committees. Members of the investment committees vote with respect to underlying investments and/or transactions and certain other matters subjected to a vote of such investment committee. Additionally, research personnel receive, and may in the future receive incentive compensation based on the performance of a certain investment accounts and investment vehicles managed by Deutsche Asset & Wealth Management and its affiliates.

This material was prepared without regard to the specific objectives, financial situation or needs of any particular person who may receive it. It is intended for informational purposes only. It does not constitute investment advice, a recommendation, an offer, solicitation, the basis for any contract to purchase or sell any security or other instrument, or for Deutsche Bank AG or its affiliates to enter into or arrange any type of transaction as a consequence of any information contained herein. Neither Deutsche Bank AG nor any of its affiliates gives any warranty as to the accuracy, reliability or completeness of information which is contained in this document. Except insofar as liability under any statute cannot be excluded, no member of the Deutsche Bank Group, the Issuer or any officer, employee or associate of them accepts any liability (whether arising in contract, in tort or negligence or otherwise) for any error or omission in this document or for any resulting loss or damage whether direct, indirect, consequential or otherwise suffered by the recipient of this document or any other person.

The views expressed in this document constitute Deutsche Bank AG or its affiliates' judgment at the time of issue and are subject to change. This document is only for professional investors. This document was prepared without regard to the specific objectives, financial situation or needs of any particular person who may receive it. No further distribution is allowed without prior written consent of the Issuer.

An investment in real estate involves a high degree of risk, including possible loss of principal amount invested, and is suitable only for sophisticated investors who can bear such losses. The value of shares/ units and their derived income may fall or rise. Any forecasts provided herein are based upon Deutsche Asset & Wealth Management's opinion of the market at this date and are subject to change dependent on the market. Past performance or any prediction, projection or forecast on the economy or markets is not indicative of future performance.

The forecasts provided are based upon our opinion of the market as at this date and are subject to change, dependent on future changes in the market. Any prediction, projection or forecast on the economy, stock market, bond market or the economic trends of the markets is not necessarily indicative of the future or likely performance.

© 2013 Deutsche Asset & Wealth Management. All rights reserved. I-031798-2.0

Office Locations:

Chicago

222 South Riverside Plaza
24th Floor
Chicago
IL 60606-1901
United States
Tel: +1 312 537 7000

Frankfurt

Mainzer Landstraße 178-190
60327 Frankfurt am Main
Germany
Tel: +49 69 71909 0

London

Winchester House
1 Winchester Street
London EC2A 2DB
United Kingdom
Tel: +44 20 754 58000

New York

345 Park Avenue
24th Floor
New York
NY 10154-0102
United States
Tel: +1 212 454 6260

San Francisco

101 California Street
26th Floor
San Francisco
CA 94111
United States
Tel: +1 415 781 3300

Singapore

One Raffles Quay
South Tower
Singapore 048583
Tel: +65 6538 7011

Tokyo

Floor 17
Sanno Park Tower
2-11-1 Nagata-cho
Chiyoda-Ku
Tokyo
Japan
Tel: +81 3 5156 6000

Research & Strategy Team – Alternatives and Real Assets

Global

Mark Roberts
Head of Research & Strategy
mark-g.roberts@db.com

Americas

Ross Adams
Industrial Specialist
ross.adams@db.com

Bill Hersler
Office Specialist
bill.hersler@db.com

Ana Leon
Property Market Research
ana.leon@db.com

Andrew J. Nelson
Retail & Sustainability Specialist
andrewj.nelson@db.com

Jaimala Patel
Quantitative Strategy
jaimala.patel@db.com

Europe

Simon Durkin
Head of Research & Strategy, Europe
simon.durkin@db.com

Tom Francis
Property Market Research
tom.francis@db.com

Matthias Naumann
Property Market Research
matthias.naumann@db.com

Asia Pacific

Leslie Chua
Head of Research & Strategy, Asia Pacific ex-
Japan & Korea
leslie.chua@db.com

Koichiro Obu
Head of Research & Strategy, Japan & Korea
koichiro.obu@db.com

Alexander Makarovski
Performance & Risk Analysis
alexander.makarovski@db.com

Alex Symes
Economic & Quantitative Analysis
alex.symes@db.com

Brooks Wells
Apartment Specialist
brooks.wells@db.com

Jay Wengang
Performance & Risk Analysis
jay.wengang@db.com

Lisa Strohbuecker
Property Market Research
lisa.strohbuecker@db.com

Maren Vaeth
Property Market Research
maren.vaeth@bd.com

Simon Wallace
Property Market Research
simon.wallace@db.com

Minxuan Hu
Property Market Research
minxuan.hu@db.com

Natasha Lee
Property Market Research
natasha-j.lee@db.com