



Are REITs Now Undervalued?

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The last couple of years have been rough for real estate, but there was a time not too long ago when it seemed that this was a 'special' asset class, with real estate investment trusts (REITs) providing valuable diversification benefits and consistently high returns. Do today's low valuations represent an opportunity to buy? Can investors expect a return to low correlations for REITs with the major equity market indexes?

Commercial real estate has not collapsed to the same degree as the residential market. Has the REIT market priced in a likelihood of a similar collapse, and subsequent defaults, in the commercial sector? If so, what are the risks to REIT investors today?

My proprietary Monte Carlo analysis provides a useful framework for answering these questions. By comparing risk metrics among REITs before and after the collapse of the real estate market, we can see how dramatically things have changed and assess the likelihood that REITs will return to their "special" status.

The answers are not encouraging for REIT investors, and I offer my assessment of what now constitutes an appropriate allocation to this asset class.

In March of 2007, I published an [analysis](#) that suggested that REITs were vastly over-valued. A month later, I wrote an [article](#) that related the over-valuation in REITs to the over-valuation in residential real estate. In the two and a half years or so since these articles were published, the real estate market has experienced a substantial correction. In this article, I look at REITs from a broader perspective that combines tactical and strategic considerations.

The changed landscape for REITs

With trailing three-year average annual returns in the double-digit negatives for REIT-based index funds like ICF and RWR, are REITs now substantially undervalued? Further, have the broad increases in correlation across asset classes affected the value of REITs as a diversifier?

Let's start by looking back three years to the height of the real estate boom. The trailing returns for REITs were stunning, and the Betas were low. The table below shows the trailing returns and risk metrics for three large REIT index funds, from Vanguard (VGSIX), iShares (ICF), and SPDR (RWR).



3 years through July 06				
Description	Ticker	Beta	Annualized Standard Deviation in Return	Average Annual Return
Cohen and Steers Realty Majors	ICF	0.93	17%	26%
Wilshire REIT Index	RWR	0.98	17%	25%
MSCI U.S. REIT Index	VGSIX	0.91	16%	24%
S&P500	SPY	1.00	8%	11%
Russell 2000	IWM	1.65	15%	15%
EAFE	EFA	1.11	11%	22%

This table includes major equity classes for comparison. As July 2006 drew to a close, the Betas of all three of these REIT index funds were below 1.00 with respect to the S&P500. A Beta greater than 1. means that a fund amplifies swings in the S&P500 (while less than 1 indicates a dampening effect). Even back in July 2006, the trailing volatility of these REIT funds (measured by the Standard Deviation in Return) was at least twice that of the S&P500.

Back in the summer of 2006, the correlations between REITs and the major equity asset classes were also quite low (see table below).

Correlations for 3 Years Through July 06						
	ICF	RWR	VGSIX	SPY	IWM	EFA
ICF	100%					
RWR	99%	100%				
VGSIX	100%	100%	100%			
SPY	45%	47%	47%	100%		
IWM	47%	50%	50%	86%	100%	
EFA	36%	37%	37%	77%	66%	100%

The correlations of ICF, RWR, and VGSIX to large cap domestic stocks (SPY), small cap stocks (IWM), and international stocks (EFA) were consistently below 50%. These levels of correlation meant that REIT funds had the potential to be effective diversifiers. The challenge for investors figuring out how much exposure to REITs they wanted lay in balancing three factors:

- 1) the attractive diversification properties of REITs
- 2) the high volatilities associated with REITs
- 3) the tactical considerations of buying REITs after years of very high returns

My [analysis](#) with Monte Carlo simulations over the years prior to the 2008 collapse in REITs increasingly emphasized the third item as the dominant consideration. From a strategic standpoint, REITs are an important asset class because of their historically-low



correlations to equities. From a tactical standpoint, the trailing returns from REITs were far higher than could be justified on any rational basis—the REIT market was clearly a bubble. In March 2007, my Monte Carlo [analysis](#) suggested that REITs were vastly over-valued. By November 2007, REITs had declined substantially, but a fresh [analysis](#) still indicated substantial overvaluation.

The next part of the story is well-known: the major decline in all asset classes in 2008-2009 included major additional declines in REITs, with 2008 being a watershed year. VGSIX lost 27% (after losing 16.5% in 2007), ICF lost 41% (after losing 18.3% in 2007), and RWR lost 38.7% (after losing 17.8% in 2007). These returns may be compared to the 37% loss suffered in 2008 by the S&P500, which had posted a 5% gain in 2007.

After two years of steep decline in REITs, the trailing three years statistics look very different than they did in July 2006:

3 years through July 09				
Description	Ticker	Beta	Annualized Standard Deviation in Return	Average Annual Return
Cohen and Steers Realty Majors	ICF	1.70	40%	-14%
Wilshire REIT Index	RWR	1.63	39%	-13%
MSCI U.S. REIT Index	VGSIX	1.61	39%	-10%
S&P500	SPY	1.00	19%	-5%
Russell 2000	IWM	1.16	24%	-4%
EAFE	EFA	1.20	25%	-3%

The trailing three-year returns for the REIT funds we considered above are now substantially in the red—far worse than those of the major equity classes. The trailing volatility has remained at about twice that of the S&P500. Volatility across all of these funds has roughly doubled (although the increase is somewhat muted for small caps). The across-the-board increase in volatility for all asset classes was expected (see [here](#)), but what is most surprising in the above results is that Betas now indicate that REITs ceased to have a muting effect on moves in the S&P500; they actually amplified market swings during the last several years.



This effect is evident in the correlations, too:

Correlations for 3 Years Through July 09						
	ICF	RWR	VGSIX	SPY	IWM	EFA
ICF	100%					
RWR	100%	100%				
VGSIX	100%	100%	100%			
SPY	82%	82%	81%	100%		
IWM	89%	90%	89%	95%	100%	
EFA	79%	79%	78%	94%	88%	100%

While the correlations between the REIT index funds and the major equity classes did not exceed 50% in July 2006, they now range from 79% to 90%. This dramatic increase in correlations means that REITs are currently providing far lower diversification value than they have historically.

Strategic asset allocation is the process of combining assets that provide positive diversification effects. Tactical asset allocation is the process of allocating to exploit relatively near-term mis-pricing among assets. With the trailing average returns of REITs very low and their correlations very high, tactical considerations dominate strategic considerations in the current environment.

Variability among REITs and key warning variables

One of the most striking features of the REIT market is the enormous disparity in Betas, volatilities, and correlations to major asset classes among different REIT assets. REITs are often treated as a monolithic asset class, but they are not. REITs can perform very differently from one another.

I divided the largest REITs into three classes: Diversified, Healthcare Facilities, and Residential:



	Ticker	Name	Market Cap	Beta	Annualized Standard Deviation in Return
Diversified REIT's	DRE	DUKE REALTY CP	2.41B	2.13	67%
	FSP	FRANKLIN ST PROP	1.01B	0.80	30%
	NNN	NATIONAL RETAIL PROP	1.61B	1.13	34%
	PCL	PLUM CREEK TIM REIT	5.39B	1.13	30%
	RYN	RAYONIER INC REIT	3.22B	1.19	33%
Healthcare Facility REIT's	HCP	HCP, INC.	7.59B	1.51	47%
	HCN	HEALTH CARE REIT	4.59B	1.07	29%
	HR	HEALTHCARE RLTY TR	1.24B	1.14	39%
	NHP	NATIONWIDE HLTH PROP	3.43B	1.23	38%
	OHI	OMEGA HEALTHCARE INV	1.49B	0.99	31%
	VTR	VENTAS INC	5.87B	1.68	52%
	ACC	AMERICAN CAMPUS COMM	1.21B	1.02	33%
Residential REIT's	AIV	APT INV & MNGMNT CO	1.28B	2.32	58%
	AVB	AVALONBAY CMTYS	5.36B	1.43	35%
	BRE	B R E PROP INC	1.49B	1.32	36%
	CPT	CAMDEN PROPERTY	2.22B	1.71	43%
	ELS	EQUITY LIFESTYLE PRP	1.28B	0.98	28%
	EQR	EQUITY RESIDENTAL	7.61B	1.32	36%
	ESS	ESSEX PRTY TR INC	1.99B	1.00	30%
	HME	HOME PPTYS INC	1.30B	1.22	36%
	MAA	MID AMER APT COMMUN	1.19B	1.23	36%
	SNH	SENIOR HSG SBI	2.40B	1.37	41%
UDR	UDR INC.	1.97B	1.29	40%	

For the three-year period through July 2009, a number of features stand out. First, we see that there is enormous variability among REITs in terms of Beta and total volatility. This variability is evident within each of the three classes. There is a huge difference between the portfolio impacts of a REIT with a Beta of 2.00+ and one with a Beta of 1.00. Similarly, there is a major difference between the portfolio impacts of a REIT with 30% volatility and one with a 50% or more volatility.

With such a diversity of REITS, differences in leverage are one significant factor (see [here](#)). Adding leverage to a REIT allows it to generate bigger returns—but also results in substantially increased risk and a higher Beta. At a recent NAREIT (National Association of REITs) conference, a [consensus emerged](#) that less-leveraged REITs will emerge as the dominant player in coming years. Not surprisingly, there is a positive correlation between leverage and market-to-book ratio: Highly-leveraged REITs tend to have high market-to-book ratios, while less leverage means lower ratios. This measure can provide some basis for differentiating between REITs, but I have found that other statistics have considerable value as well.

One useful question, for example, is which variables, if any, could have helped flag the REITs and REIT indexes that were most vulnerable to the 2007 real estate crash. By analyzing the above REITs through July 2006, I discovered which variables were the best predictors of loss. The half of these funds with the highest Betas at that time generated returns substantially better than the half with lower Betas—a difference of about 15% per year in the subsequent three-year period. The high-Beta REITs and



REIT funds had slightly higher trailing volatility than their low-Beta counterparts, a result that seems somewhat paradoxical. When the broader market declines, high-Beta investments are expected to decline more than low-Beta investments. To investigate this further, I separated the half of these REITs and REIT funds with the highest Betas from those with the lowest Betas (as of July 2006) and analyzed them as two separate portfolios in a portfolio Monte Carlo simulation (Quantext Portfolio Planner).

Monte Carlo projections for low Beta REIT's (through July 06)

		Monte Carlo Projections	
Fund Name	Percentage of Funds	Average Annual Return	Standard Deviation(Annual)
ICF	8.3%	18.25%	30.60%
VGSIX	8.3%		
UDR	8.3%	Historical Data	
EQR	8.3%		
HCP	8.3%	Start:	End:
AVB	8.3%	7/31/2003	7/31/2006
ESS	8.3%	Average Annual Return	Standard Deviation (Annual)
DRE	8.3%	23.15%	15.29%
CPT	8.3%	Historical Beta: 78.12% Historical Yield: 4.86% Portfolio R ² : 15.4%	
BRE	8.3%		
HME	8.3%		
ELS	8.3%		

This portfolio, with equal weights to the low-Beta REIT's, exhibited very high trailing returns as of 7/31/2006—the trailing return and volatility are very close to the results for the REIT funds cited earlier. Note that the Monte Carlo projected returns are considerably lower than the trailing returns (by about 5% per year: 18.25% vs. trailing return of 23.15%) and the projected volatility is twice the trailing volatility. By March of 2007, my Monte Carlo [projections](#) were that REIT's were vastly over-valued.



Monte Carlo projections for high Beta REIT's (through July 06)

		Portfolio Stats	
Fund Name	Percentage of Funds	Average Annual Return	Standard Deviation(Annual)
RYN	8.3%	19.05%	31.80%
SNH	8.3%		
PCL	8.3%	Historical Data	
HR	8.3%		
OHI	8.3%	Start:	End:
HCN	8.3%	7/31/2003	7/31/2006
MAA	8.3%	Average Annual Return	Standard Deviation (Annual)
RWR	8.3%	22.01%	16.13%
VTR	8.3%	Historical Beta: 110.56% Historical Yield: 6.64% Portfolio R ² : 27.8%	
NHP	8.3%		
NNN	8.3%		
AIV	8.3%		

The high-Beta REIT portfolio had a July 2006 Beta of 1.1 vs. .78% for the low-Beta case. The high-Beta REIT portfolio had a significantly higher yield and almost double the R-squared (relative to the S&P500) of the low-Beta portfolio. QPP also suggests that the low-Beta portfolio is more overvalued than the high-Beta portfolio.

Low-Beta Excess Returns = 23.15% - 18.25% = 4.90% per year

High-Beta Excess Returns = 22.01% - 19.05% = 2.96% per year

As of the end of July 2009, both of these portfolios had trailing three-year Betas of about 1.40 and R-squared values of 60% relative to the S&P500.

The difference between trailing returns and expected returns is an important tactical variable (see [here](#)). Asset classes that have returned considerably more than their expected returns are likely to revert to the mean and deliver lower returns (and vice versa). Reversion to the mean was one of the big warning signals going into late 2007 and 2008. Even among REITs, I have noted that the high-Beta REITs as a group were less over-valued on this basis than the low-Beta REITs. I sorted all of the REITs and REIT funds just based on the difference between trailing three-year return and QPP expected returns using data through July 06, and I found that REITs that were under-valued (expected return greater than trailing three-year return) out-performed REITs that were over-valued (expected return less than trailing return) by 9.3% in average annual return over the next three years.



The real estate bubble was obviously driven by dynamics that were at work for more than just the last three years, so I generated QPP projections using ten years of trailing data (through July 2009) and compared the expected return to the trailing ten-year return for all of the REITs and REIT funds that had at least ten years of data available. The results were striking. The trailing ten-year average return for all of the REITs in our sample was 14.1% (arithmetic average annual return). The expected average annual return for the REITs from the Monte Carlo simulation was 14.0%. In other words, REITs as a group were more or less fairly valued at the end of July 2009. There is, however, quite a spread within the asset class—some REITs look under-valued and some look over-valued on this statistical basis.

Default risks for REITs

REITs and residential real estate are at different points on the [continuum of risk and return](#). REITs are riskier than residential real estate but also have the potential for higher returns. It is not surprising, then, that there is growing [concern](#) that there may be a collapse in commercial real estate following the same trajectory as that of the residential real estate market.

How might we examine the implied risks ahead for REITs? One [approach](#) is to consider the projected volatility in REIT ETF indexes as a measure of default risk. I have previously discussed that projected downside risk from Monte Carlo simulations and implied volatility provide meaningful estimates of default risk. Implied volatility is the volatility that must be assumed in order to reconcile options prices with market prices for an instrument. It is not surprising that the cost to purchase a put option on a stock or index reflects the market's assessment of default risk. A put option is similar to buying insurance against loss from price declines. When we reconcile options prices with a Monte Carlo simulation, we can look at projected probabilities of losses at various levels. We can look, for example, at the projected level of loss in the worst 1% of outcomes over a year. This is qualitatively referred to as 'tail loss' or 'tail risk.'

Implied volatility and projected volatilities from Monte Carlo simulations signaled the potential for notable collapses in finance, homebuilding, and other sectors in early 2008. The put and call options on ICF, a REIT ETF that expires in February 2010, have an implied volatility of 44% vs. 26% for the S&P500. Our Monte Carlo projections generate numbers consistent with these.

The projected 1-year / 1% worst loss for ICF as of August 2009 is -84%. In other words, the simulation projects that there is a 1-in-100 chance that ICF will lose at least 84% of its value over the next twelve months. In my analysis of projected tail losses vs. credit ratings, I suggested that investors wishing to avoid taking on significant default risk not invest in assets with a 1-year / 1% projected loss worse than -60%. There is high current default risk implied for even 'diversified' REIT indexes, since diversification



across multiple REITs provides very limited protection—REITs as a group are exposed to similar risk factors. To put this into context, the projected 1-year / 1% loss level projected today for ICF is near what our [model](#) was projecting for Ford and the home builder Lennar in March of 2008.

The high level of projected volatility and default risk for REITs is largely driven by the broad increase in risk across all markets and, to a lesser extent, by the increased correlation between REITs and broad equity asset classes. The default risks for REITs scale with their projected volatilities, so some REITs are much riskier than others.

Conclusions

REITs have gone from being a bubble asset to a crashed market, and the increased correlation between REITs and other major asset classes has reduced their diversification value. As of the end of July 2009, Monte Carlo simulations showed REITs to be fairly valued, on average. Specifics of boom and bust aside, one of the basic features of REITs that investors largely ignored during the bubble years is their riskiness as an asset class. They have about twice the volatility of the S&P500, and this feature has remained consistent through both boom and bust. REITs are consistently more risky than small cap stocks or international stocks. In the more volatile and highly correlated market conditions that we encounter today, the default risks associated with REITs are particularly high. Options going out 2-3 years for the S&P500 suggest that this volatility will continue.

From the perspective of Strategic Asset Allocation, REITs have a place in a well-diversified portfolio, but they should never exceed 15% of the total allocation, even for the most aggressive portfolios operating in the most benign market conditions. For the risk tolerance of a typical individual investor, an allocation to REITs should range between no more than 5% to 10% (see [here](#)). In today's higher-volatility market environment (which long-dated options suggest will persist for some time), this allocation should be limited even further. REITs have the advantage that they hedge against inflation, but there are far less risky ways to gain an inflation hedge. It is likely that correlations between REITs and other asset classes will decline over time from their very high levels in 2008-2009, but that time horizon is unclear.

From the perspective of Tactical Asset Allocation, REITs appear quite reasonably valued when we compare ten-year returns to Monte Carlo projections. That said, the relative values of REITs are not at all consistent—some remain over-valued and others look under-valued.

One striking result from our analysis is the wide disparity among REITs in terms of Beta and total volatility. The classification of REITs as a single asset class makes sense, but risk varies greatly among REITs. These effects translate to differences in valuation—there are nuanced ways to find REITs that can add tactical value. The substantial out-



performance since July 2006 of REITs that Monte Carlo simulation could have flagged as undervalued at that time is notable. The out-performance of higher-Beta REITs is also interesting but this discrepancy is difficult to explain and thus of limited value from a tactical standpoint.

The fact that some REITs are undervalued does not mean that they cannot become substantially more undervalued before things equilibrate. The very high implied and projected volatilities in REITs mean that the ride will be very bumpy. Add to this the fundamentals-based concerns about the state of the credit markets, and there is good reason for those considering investing in REITs to experience trepidation.

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