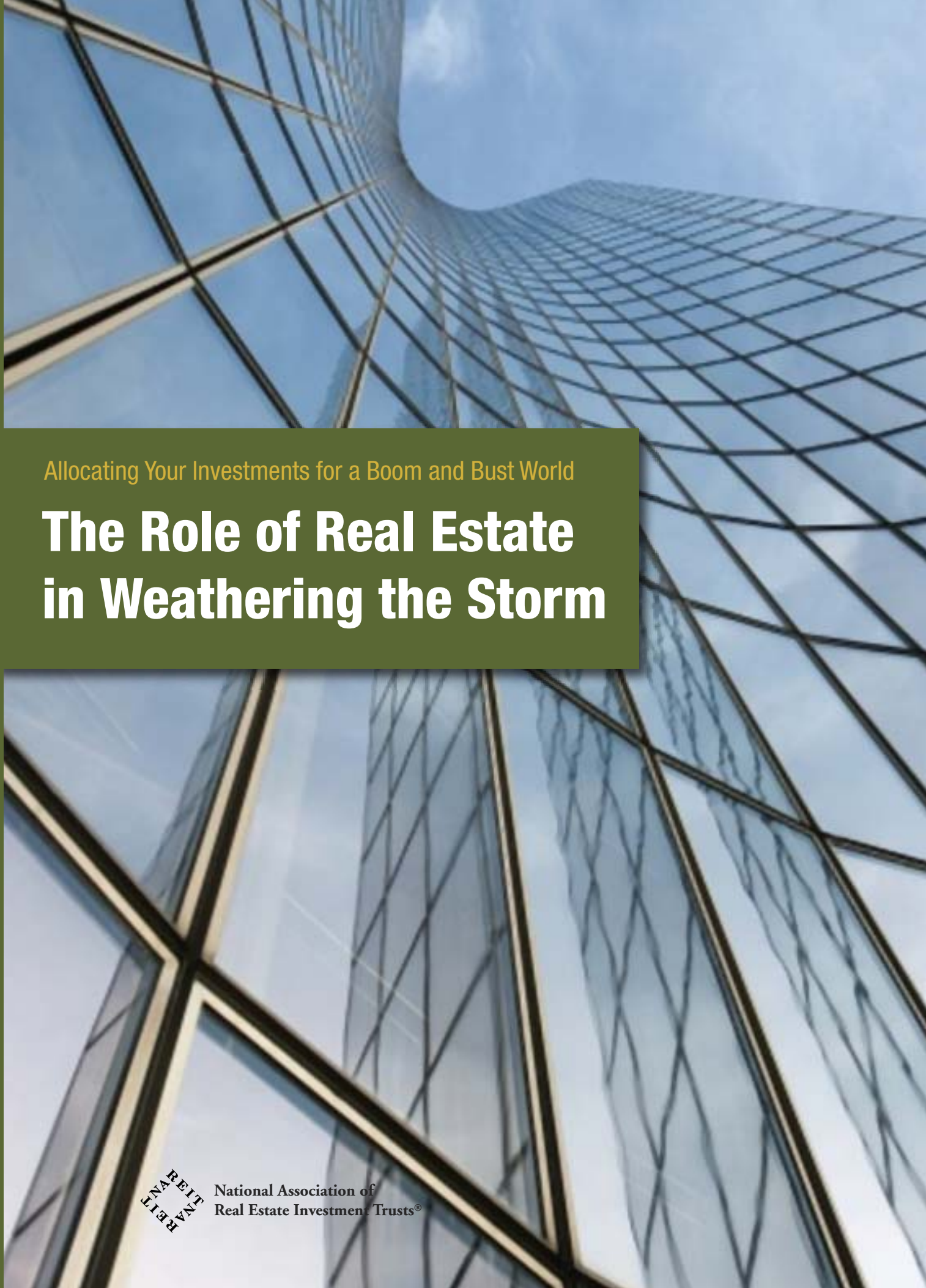

Allocating Your Investments for a Boom and Bust World

The Role of Real Estate in Weathering the Storm

National Association of
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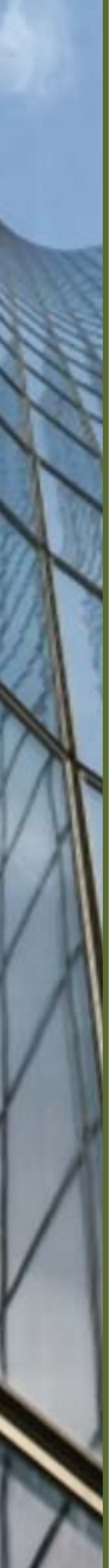


The Role of Real Estate in Weathering the Storm

Modern portfolio theory has taught investors for years to maximize returns and minimize risk by diversifying their investment portfolios to include stocks, bonds, real estate, cash and other assets. Maximizing returns is straightforward enough. But, what about *risk*? For most investment professionals, minimizing risk means minimizing *volatility*, the daily or monthly ups and downs of the value of your investments. Sounds reasonable enough. But, do most investors really view a five percent increase in the value of their investments in the same light as a five percent decline? Do we care the same about a $10,000 profit as we do about a $10,000 loss? When we diversify our investments, are we seeking to minimize volatility, or are we really hoping to avoid large *losses*?

In recent years, investors have questioned why supposedly "rare" events such as the financial crisis of 2008-2009 and the resulting market collapse seem to occur with more frequency and greater severity than traditional model portfolios predict they should. Research has revealed how often models of investment returns based on the *normal* distribution underestimate the frequency of severe market declines. From January 1926 to April 2009, the S&P 500 Index suffered 10 monthly losses greater than 15.74 percent, or eight times more often than an investor would expect based on the *normal* distribution of returns assumed by many investment strategists and their models. The consequences of such supposedly rare events for many investors can be severe. For the 10-year period 2000-2009, a period coined the *Lost Decade* by many investors, the compound annual total return for large cap stocks as measured by the S&P 500 was a *negative* 0.95 percent. *Ouch!*

In theory, diversification should protect us from large losses in the value of our total portfolio because not all investments are expected to suffer large losses at the same time. But, what if most of them do fall together, as occurred during the financial crisis? Given what we now know about extreme market events, how should we diversify our investments to minimize loss of wealth while maximizing returns? Can investors protect their portfolios to better withstand periods of market turmoil and better protect themselves from large losses by adjusting their allocations to account for the downside risk of extreme market events like the recent financial crisis? If so, what would such a portfolio look like? A recent NAREIT-commissioned Morningstar® data analysis using the latest advances in portfolio optimization sheds light on this question.

The Morningstar analysis looked at 20 years of data for nine global asset classes including stocks, bonds, real estate and cash. The analysis used both *normally* distributed returns and *non-normally* distributed returns, reflecting the more hazardous market environment in which we actually invest.

- For risk-averse investors, an optimization based on capital market assumptions produced portfolios allocated mostly to bonds and real estate using either *normally* or *non-normally* distributed returns. However, the portfolio based on *non-normal* returns increased the allocation to North American REITs and produced annualized returns of 8.2 percent compared with 7.6 percent for the portfolio based on *normal* returns and the same low level of five percent volatility.

- For moderate-risk investors, an optimization based on capital market assumptions produced portfolios with allocations more evenly balanced across stocks, bonds and real estate using either *normally* or *non-normally* distributed returns. But, the *non-normal* portfolio produced annualized returns of 9.7 percent compared with 9.4 percent for the *normal* portfolio with the same level of 10 percent volatility.

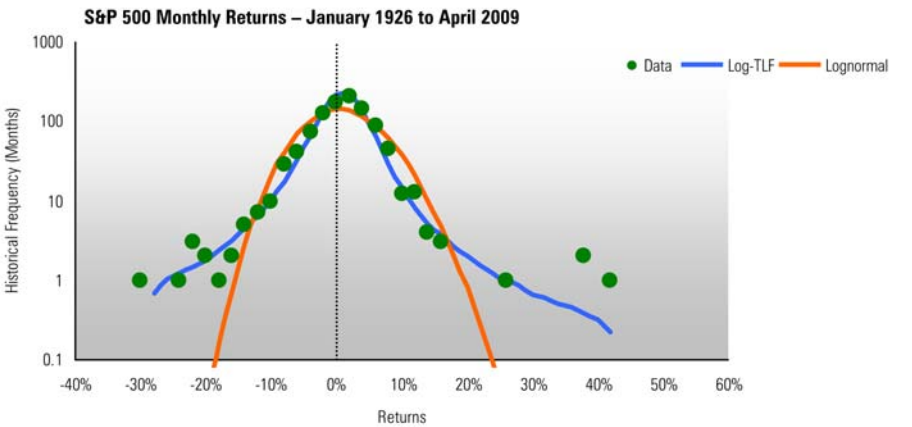
- Investors often have limited their portfolio allocations to stocks, bonds and cash, unaware of the potential diversification benefit of real estate. The Morningstar analysis shines a surprising light on the role of real estate securities in normal times, but also in the most non-normal of times. The analysis found that allocating around 14 percent to 20 percent of a global investment portfolio to North American commercial real estate stocks (REITs) benefited investors having a low to moderate risk tolerance, *especially* when extreme downside risk associated with financial crises is factored into the analysis.

A Hundred Year Storm Every Ten Years?

In response to the financial crisis of 2008-2009, investors have questioned some of the underlying assumptions of modern portfolio theory. In particular, investors have observed negative investment returns of greater magnitude and higher frequency than those implied by the *normal* statistical distribution of investment returns on which most asset allocation models typically rely, *i.e.*, the typical bell-shaped curve implying equally likely high and low outcomes.

In a published report by James X. Xiong of Ibbotson Associates, a Morningstar company, data from January 1926 to April 2009 reveal that the S&P 500 Index suffered 10 monthly losses worse than -15.74 percent, a negative return three standard deviations below the S&P 500 Index's mean return assuming returns are *normally* distributed.[1] As illustrated in Exhibit 1, it is clear that the lognormal distribution fails to adequately fit the distribution of monthly equity returns below -15 percent. The record implies that the probability of this kind of catastrophic event is eight times more likely than would be expected using a normal distribution. That's basically the equivalent of having a "hundred-year storm" every 10 years.

Exhibit 1: Truncated Lévy Flight vs. Lognormal Distribution



Source: James Xiong. "Using Truncated Lévy Flight to Estimate Downside Risk." Forthcoming in the Journal of Risk Management

ibbotson

The downside risk owing to such "rare" events (or "fat tails" as they are known to statisticians) seldom is mitigated when using traditional mean-variance optimization (MVO) to develop portfolio allocations. Thus, the Morningstar analysis was expanded to incorporate more recent advances in portfolio optimization that assume a higher frequency of extreme, "fat-tail" market events. Such allocations, based on *non-normally* distributed returns, then can be used to determine how robust the allocations are when using traditional MVO.

Morningstar's expanded analysis assumes investors are more averse to the risk of large losses than they are embracing of the risk of large gains; controlling for loss of wealth is more important than controlling for volatility of returns. Such loss aversion is modeled by Morningstar using mean-conditional value-at-risk (M-CVaR) optimization, which accounts for *non-normally* distributed returns and replaces the correlation matrix of asset returns with a scenario-based model.[2] In scenarios representing *normal* market activity, returns in different equity markets are modeled as moving somewhat independently and uncorrelated; whereas, in *non-normal* scenarios representing financial crises, returns are modeled as moving down together. Thus, M-CVaR focuses more on the probability of extreme losses and penalizes asset classes for which this probability is elevated.

[1] See "Using Truncated Levy Flight to Estimate Downside Risk," James X. Xiong, *Journal of Risk Management in Financial Institutions*, Vol. 3, No. 3, pp. 231-242.

Positioning Your Portfolio Ahead of the Storm

The Morningstar analysis included six of the most common asset classes plus North American, European and Asian commercial real estate from 1990 through 2009, a period that includes the 2008-2009 worldwide financial crisis. Exhibit 2 compares optimized portfolios based on historical capital market assumptions for risk-averse and moderate risk investors using both traditional MVO and Morningstar's M-CVaR optimization, which accounts for the non-normality of returns and allocates investments to minimize the expected loss and help one's portfolio weather the effects of severe market declines.

The analysis shows that:

- For risk-averse investors, allocating investments to minimize expected losses and build a more resilient portfolio using M-CVaR optimization produced annualized returns of 8.2 percent compared to 7.6 percent using the *normal* MVO portfolio, assuming a low five percent expected portfolio volatility. Not surprisingly, both risk-averse portfolios are heavily weighted toward bonds at about 85 percent of the total portfolio. However, both also have moderate allocations to global REITs and listed real estate equities, reflecting the bond-like attributes of real estate returns. In particular, the allocation to North American listed REITs and real estate equities increased from six percent of the *normal* portfolio to 14 percent of the *non-normal* M-CVaR portfolio.
- For moderate-risk investors willing to accept portfolio volatility of 10 percent, M-CVaR optimization produced annualized returns of 9.7 percent. However, total stock allocations increased from 20 percent to 39 percent, and total bond allocations were reduced from 54 percent to 41 percent. Once again, however, the allocation to North American listed REITs and real estate equities increased from 18 percent to 20 percent in the *non-normal* M-CVaR portfolio.

Exhibit 2: Mean-Variance (MVO) and Mean-Conditional Value-at-Risk (M-CVaR)

Risk Averse and Moderate Risk Optimal Portfolios (1990 - 2009)

	Risk averse portfolio		Moderate risk portfolio	
Asset class	Mean-Variance Optimization	Mean-CVaR Optimization	Mean-Variance Optimization	Mean-CVaR Optimization
Domestic large stocks	1	0	16	20
Domestic small stocks	0	0	4	19
International stocks	1	0	0	0
Domestic bonds	75	71	43	26
Cash	5	0	0	0
International bonds	10	15	11	15
North American real estate	6	14	18	20
European real estate	1	0	3	0
Asian real estate	1	0	5	0
Expected return (%)	7.6	8.2	9.4	9.7
Standard deviation (%)	5	5	10	10
Equity allocation (%)	10	14	46	59

Past performance is no guarantee of future results. This is for illustrative purposes only and not indicative of any investment. An investment cannot be made directly in an index. Note: Statistics rounded to the nearest whole. 12/1/2010

[2] See "Mean-Variance Versus Mean-Conditional Value-at-Risk Optimization: The Impact of Incorporating Fat Tails and Skewness into the Asset Allocation Decision," James X. Xiong and Thomas Idzorek, Ibbotson (A Morningstar Company), February 2010.

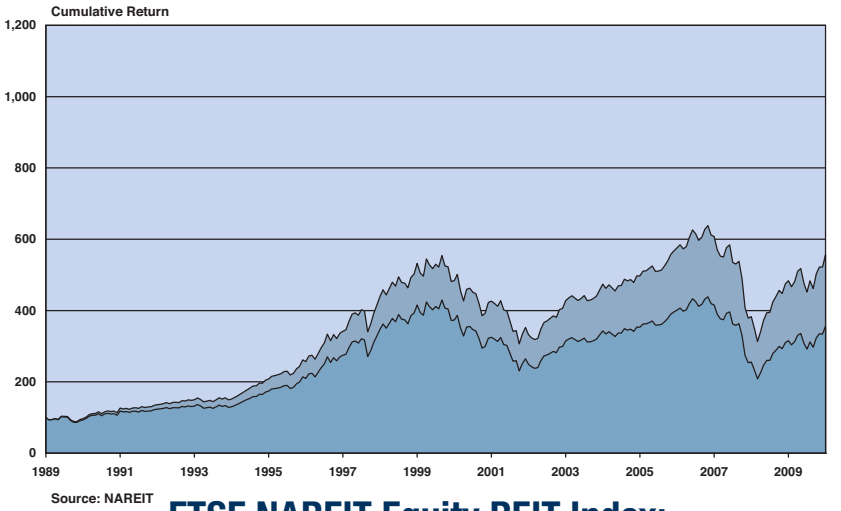
The Consistent Role of REIT Dividends in Weathering the Storm

A noteworthy finding in the analysis was the consistent role of real estate investment through REITs in *normal* MVO portfolios – structured to minimize expected volatility – and *non-normal* M-CVaR portfolios – structured to minimize expected losses. In other words, the intervention of the most serious financial crisis recorded in the publicly traded real estate asset class did little to change the implied optimal role of global listed real estate equities in a diversified investment portfolio. Although allocations to international real estate equities were lowered, the allocation to North American REITs was increased, and risk-adjusted returns also were increased. In an optimization based on historical capital market assumptions for the period 1990-2009, and on resampling techniques that allow for the uncertainty of future investment returns, the optimization produced portfolios with allocations from 14 percent to 20 percent of a global investment portfolio in REITs for investors with low to moderate risk tolerance.

That real estate should be "a steady part of the diet" using either MVO or M-CVaR optimized portfolios may seem counterintuitive given the volatility of real estate during the financial crisis. However, the high and steady dividends distributed by REITs year-in and year-out play a large role in the total return of REITs. Returning to the *Lost Decade*, when the S&P 500 Index posted its compound annual total return of *negative* 0.95 percent, it is noteworthy that the FTSE NAREIT All Equity REITs Index delivered a compound annual total return of *positive* 10.63 percent.

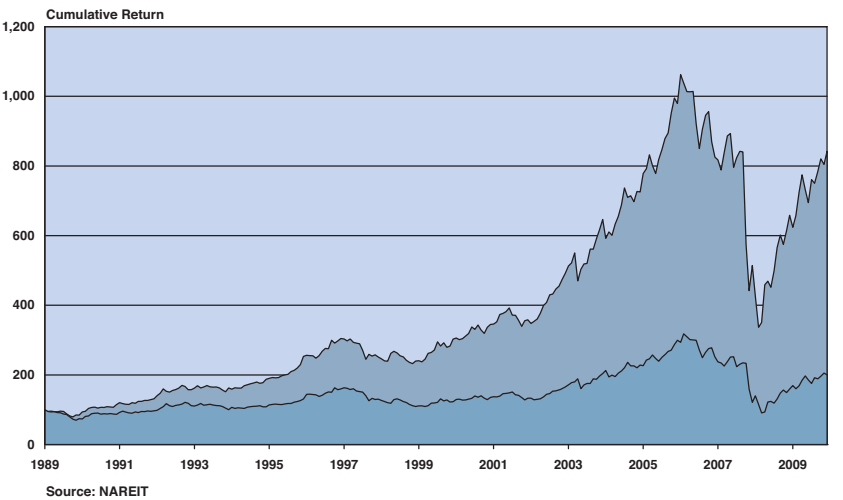
Dividends are important! Exhibit 3 reveals that the relatively high and stable dividends of REITs have provided investors with appreciably higher total returns when compared with other equities. Because REITs are required to distribute annually to their shareholders at least 90 percent of their taxable income in the form of dividends, approximately 56 percent of the total return from U.S. REITs over the period December 1989 - December 2010 came from dividends, compared with only 23 percent of the total return from companies in the S&P 500 Index.

Exhibit 3
S&P 500 Index:
December 1989 - December 2010



Source: NAREIT

FTSE NAREIT Equity REIT Index:
December 1989 - December 2010



Source: NAREIT

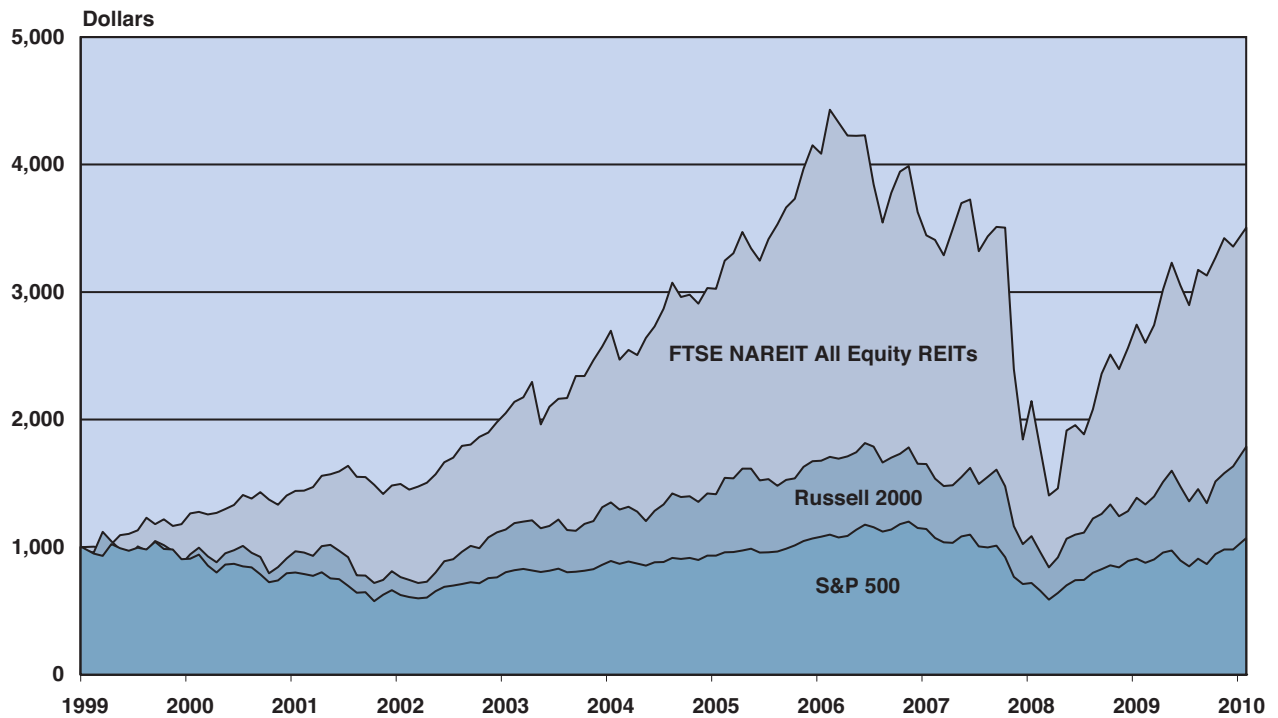
The Consistent Role of REIT Dividends in Weathering the Storm

Exhibit 4 illustrates the cumulative impact of reinvested dividends on long-term investment performance. Although cumulative price returns typically have been higher for other equities than they have been for REITs, the generous dividend distributions of REITs (when reinvested) have provided investors with total returns that far exceed those of other large-cap and small-cap equities.

High dividend income provides the cushion to potentially weather the storm of losses incurred during severe market sell-offs. During the financial crisis, for example, REIT share prices declined 71 percent from the end of January 2007 to the end of February 2009, but a $1,000 investment made on January 1, 2000 still would have been worth $1,404 (including dividends) at the end of the market decline. By comparison, share prices for companies in the S&P 500 declined only 53 percent from the end of October 2007 to the end of February 2009, but a $1,000 investment in the S&P 500 made on January 1, 2000 would have been worth only $588 after the fall. Likewise, share prices for companies in the Russell 2000 also declined only 53 percent from the end of May 2007 to the end of February 2009, but a $1,000 investment in the Russell 2000 made on January 1, 2000 would have been worth only $867 when the sell-off ended.

Because dividends play a much smaller role in the total returns of other equities, investors in those asset classes had far less cushion to weather the loss of value when the market crashed. For those investors worried about down-side risk, real estate investment through REITs is one place you want to be.

Exhibit 4: Growth of a $1,000 Investment
2000 - 2010



Source: NAREIT

Conclusion

When managing your portfolio to minimize expected losses from rare but severe financial storms, such as the worldwide financial crisis of 2008-2009, Morningstar's analysis suggests staying the course with diversified investments in stocks, bonds and real estate. An optimization based on historical capital market assumptions from 1990 to 2009 also suggests that putting around 14 percent to 20 percent of a global investment portfolio in real estate equities benefits investors with low to moderate risk tolerance – *especially* when extreme downside risks such as the recent worldwide financial crisis are factored into the analysis. Commercial real estate is a large part of the market portfolio, and diversifying the global portfolio to include real estate stocks alongside other stocks and bonds can potentially increase risk-adjusted returns and minimize expected losses for both risk-averse and moderate-risk investors.

Contacts

Institutional - **Meredith Despins**, VP Investment Affairs and Investor Education, 202-739-9452, mdespins@nareit.com
Media - **Ron Kuykendall**, VP Communications 202-739-9425, rkuykendall@nareit.com

National Association of Real Estate Investment Trusts®
1875 I St, NW, Suite 600, Washington, DC 20006 • Phone: 202-739-9400 Fax: 202-739-9401 • REIT.com