Many investors think of real estate investment trusts (REITs) as a distinct asset class because, in aggregate, they historically have had relatively low correlation with both stocks and bonds, and their returns were not well explained by the single-factor CAPM model. For example, over the period from January 1978 through May 2017, the monthly correlation of the Dow Jones U.S. Select REIT Index with the S&P 500 was 0.58, and was just 0.08 with five-year Treasury bonds.

The low correlation, along with the fact that the Dow Jones Select REIT Index produced a higher return (12.2%) than either the S&P 500 (11.7%) or five-year Treasury bonds (7.1%), led many investors to believe that adding REITs to a mixed-asset portfolio expanded the efficient frontier, providing superior risk-adjusted returns.

The evolution of modern financial theory and the development of more sophisticated multi-factor models provide us with tools to question the “traditional” view of REITs as both a separate asset class and one that expands the efficient frontier. With that in mind, I will review recent papers that specifically address these issues. The first is a May 2017 study by two of my colleagues, Jared Kizer and Sean Grover of the Buckingham Family of Financial Services.

Motivated by the observation that a lot of previous research treated REITs as a distinct asset class based on correlation alone, they decided to take another look at REITs in their own study, Are REITs a Distinct Asset Class? Their data sample covered the period from January 1978 through September 2016.

Kizer and Grover began by establishing criteria that an asset class must meet for it to be considered distinct. These criteria are:

1. Low correlation with established asset classes, such as broad market equities and government bonds.
2. Statistically significant positive alpha with respect to generally accepted factor models.
3. Inability to be replicated by a long-only portfolio holding established asset classes.
4. Improved mean-variance frontier when added to a portfolio holding established asset classes.

Prior research had shown that, in terms of equity risk, REITs have significant exposure not only to market beta, but also to the size and value factors. In addition, they have been shown to have exposure
to the term premium. In their analysis, Kizer and Grover employed a six-factor model comprising the market, size, value and momentum equity factors as well as the term and credit bond factors. The credit factor (referred to as IGDEF) subtracts the return of a duration-matched portfolio of Treasury bonds from the total return of the corporate bond index in order to isolate the return premium associated with the weaker credit of corporate bonds.

Their regression analysis included not only REITs, but also 12 other industries available on Ken French’s website. The following is a summary of their findings:

- Demonstrating the explanatory power of the six-factor model, virtually all industries are well explained by four equity factors and two fixed income factors. Only one industry category (a catch-all that included mining, construction, transportation, entertainment and hospitality, among other sectors) had statistically significant annualized alpha, and the estimate was negative. It demonstrates that the factor model works well in explaining returns across industries, including REITs.

- The annual alpha estimate for REITs was -0.89% with a t-stat near zero (-0.3).

- REITs showed statistically significant exposures to market beta (0.61 with a t-stat of 10.2), size (0.44 with a t-stat of 6.1) and value (0.77 with a t-stat of 9.9), as well as a small negative (-0.08) and statistically insignificant (t-stat of -1.7) exposure to the momentum factor, a large (0.70) and statistically significant (t-stat of 3.8) exposure to the term premium, and a large (0.92) and statistically significant (t-stat of 3.9) exposure to the credit (default) premium.

- While the R-squared ratio (which measures how well the factor model explains returns) was relatively low for REITs (0.51), this was also true for other industries, including energy, utilities and health care.

These findings led Kizer and Grover to conclude that while the low R-squared ratios cited in the last bullet point above indicate diversifiable risks present in each industry, they do not indicate uniqueness in underlying return drivers. They state: “While the relatively low correlation with the S&P 500 Index and 5YT was encouraging, the four- and six-factor regression models indicate that REITs are likely not a distinct asset class, especially when compared to the results of other industries.” Their evidence demonstrates that, while REITs may meet the first of the four criteria they established (low correlation), they fail to meet the second (significant alpha).

Kizer and Grover next tested REITs against the third criteria — a distinct asset class should not be easily replicated by a long-only portfolio of established asset classes. Given the factor exposures they had found, and using returns for U.S. small-cap value stocks (SV) from Ken French’s data library and the Barclays long-term corporate bond index (CORP), they attempted to replicate REITs return with these two returns series.

The following table shows the results of a portfolio allocating about 67% to SV and 33% to CORP. This optimal (in the sense that it had the best fit using historical data) replicating portfolio has a monthly correlation with REITs of 0.72. The table also presents other statistics that compare the optimal replicating portfolio to REITs over the period from January 1978 through September 2016.

MONTHLY RETURN SUMMARY STATISTICS (JANUARY 1978-SEPTEMBER 2016)
<table>
<thead>
<tr>
<th></th>
<th>REITs</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Return (%)</td>
<td>1.13</td>
<td>1.20</td>
</tr>
<tr>
<td>Compound Return (%)</td>
<td>12.5</td>
<td>14.3</td>
</tr>
<tr>
<td>Standard Deviation (%)</td>
<td>18.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.49</td>
<td>0.73</td>
</tr>
<tr>
<td>Minimum Return (%)</td>
<td>-32.4</td>
<td>-17.3</td>
</tr>
<tr>
<td>Maximum Return (%)</td>
<td>32.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Maximum Drawdown (%)</td>
<td>-70.5</td>
<td>-46.7</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.7</td>
<td>-1.0</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>10.7</td>
<td>5.9</td>
</tr>
<tr>
<td>Percent Negative Periods</td>
<td>39</td>
<td>31</td>
</tr>
</tbody>
</table>

As you can see, the replicating portfolio dominates REITs in almost every way — it earns higher compound returns, has lower volatility, achieves a higher Sharpe ratio, has lower kurtosis and wins on most historical risk characteristics. A skeptic might note the replicating portfolio has a 33% allocation to long-term corporate bonds during a period in which interest rates have declined significantly, but the regression results show the term factor loading for the replicating portfolio is lower than the term factor loading for REITs. Thus, interest rate risk exposure can't account for the results.

Kizer and Grover then tested REITs against their fourth criteria and concluded REITs fail to improve the mean-variance frontier, on a statistically inferred basis, when added to a portfolio holding established asset classes.
In summary, after first establishing a pragmatic list of criteria for considering asset classes, Kizer and Grover found that, while REITs do exhibit relatively low correlation with traditional equity and fixed income, a deeper dive into REIT returns reveals shortfalls in its qualifications for recognition as a distinct asset class.

They found that multi-factor regression analyses revealed no statistically reliable alpha generation in REIT returns and that REIT returns are well explained by traditional risk factors. They also found that a long-only replication of REIT returns with small-value equities and long-term corporate bonds produces a portfolio that co-moves well with returns to REITs and exhibits historical return and risk characteristics generally better than REITs. And finally, they found that REITs do not reliably improve the mean-variance frontier when added to a benchmark portfolio of traditional stocks and bonds. These results, and the associated failure to satisfy their asset class criteria, lead Kizer and Grover to conclude that REITs are not a distinct asset class.

Further evidence

We now turn to a second study, REITs in a Mixed-Asset Portfolio: An Investigation of Extreme Risks, which appears in the summer 2017 issue of The Journal of Alternative Investments. The authors, Steven Stelk, Jian Zhou and Randy Anderson, investigated the impact over the last two decades that including an allocation to REITs had on what is referred to as the value at risk (VaR) of a portfolio of stocks and bonds. VaR has become a standard measure of a portfolio’s market risk, and it is used by both investors and regulators.

Perhaps Stelk, Zhou and Anderson were motivated by the fact that real estate was at the epicenter of the 2008 global financial crisis, and that REITs have become an increasingly popular investment vehicle. They note, for instance, that the market capitalization of U.S. REITs grew from $11.7 billion in 1989 to more than $907 billion in 2014. The authors may also have been motivated by the fact that even though REITS had provided higher returns than the S&P 500, and did so with low correlation to both stocks and bonds, they did so with much higher volatility.

The following table shows annualized returns, standard deviations and Sharpe ratios for the Dow Jones Select REIT Index, the S&P 500 Index and five-year Treasury bonds over the period from January 1978 through May 2017.
<table>
<thead>
<tr>
<th></th>
<th>Dow Jones Select REIT Index</th>
<th>S&amp;P 500 Index</th>
<th>Five-Year Treasuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized Return (%)</td>
<td>12.2</td>
<td>11.7</td>
<td>7.1</td>
</tr>
<tr>
<td>Annual Standard Deviation (%)</td>
<td>18.4</td>
<td>14.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.41</td>
<td>0.51</td>
<td>0.47</td>
</tr>
</tbody>
</table>

While the REIT index did provide higher returns, it did so with sufficiently greater volatility that the Sharpe ratio of the S&P 500 Index was 24% higher. And the Sharpe ratio of five-year Treasury bonds was, on a relative basis, 15% higher. This is important in light of the finding from Kizer and Grover that replicating portfolios were more mean-variant efficient than REITs.

Stelk, Zhou and Anderson began by reviewing some of the latest academic research on REITs. Among the research they cited was:

- Anderson, Vaneesha Boney and Hany Guirguis, authors of the 2012 study *The Impact of Switching Regimes and Monetary Shocks: An Empirical Analysis of REITs*, found that unexpected monetary shocks affect REITs about twice as greatly as they affect the general equities market under high-variance regimes.

- A 2012 study from Zhou and Anderson, *Extreme Risk Measures for International REIT Markets*, found that the extreme risks for REITs generally are higher than those of nine non-U.S. stock markets they studied, and that the timing of extreme market movements between REITs and stock indexes is almost perfectly in sync. They concluded the diversification benefits of REITs are sometimes not present when they are needed most.

- Kim Hiang Liow, who authored the 2008 study *Extreme Returns and Value at Risk in International Securitized Real Estate Markets*, found REIT returns are riskier than the corresponding broader stock indexes in each of the seven countries he considered.

- Jian Yang, Yinggang Zhou and Wai Kin Leung, authors of the 2012 study *Asymmetric Correlation and Volatility Dynamics among Stock, Bond, and Securitized Real Estate Markets*, found REIT returns exhibited stronger asymmetric correlations than stock, bond or even collateralized mortgage-backed securities over their sample period from 1999 through 2008. Asymmetric volatility was defined as increased return volatility after a negative shock.

- Martin Hoesli and Reka Kustrim, authors of the 2013 study *Volatility Spillovers, Comovements and Contagion in Securitized Real Estate Markets*, analyzed the relationship between the volatility of securitized real estate markets and stock markets from 1990 to 2010, and found that equity returns are significantly more connected to the returns of securitized real estate when both
markets are crashing compared to when they are booming.

- Luis Garcia-Feijoo, Gerald Jensen and Robert Johnson, authors of the 2012 study *The Effectiveness of Asset Classes in Hedging Risk*, examined the diversification benefits of several categories of alternative investments on a mixed-asset portfolio. They found REIT returns had some of the highest correlations with stock and bond returns over their sample period of January 1970 through December 2010, and thus offer the lowest diversification benefits.

Based on the research they examined, Stelk, Zhou and Anderson concluded that the “existing evidence suggests that REITs can provide portfolio diversification benefits under some market conditions, but not all. There is significant evidence that REITs may be harmful to a mixed-asset portfolio during times of market distress.” Thus, the authors decided to explore what effects, if any, REITs have on the extreme risks of a mixed-asset portfolio.

Their data sample covered the U.S. REIT market during the period from 1989 through 2010. Their baseline portfolio allocation was the traditional 60% stocks/40% bonds. They then added a 10% and a 20% allocation to REITs to the portfolio, taking the REIT exposures equally from the stock and bond allocations. And finally, given the evidence that REITs have significant exposure to small-stock risk, they substituted small-cap stock exposure for the 10% and 20% REIT exposures.

The following is a summary of the authors’ findings:

- Adding REITs to a mixed-asset portfolio does not have a significant impact on the average daily return or VaR of a portfolio before 2006 (before the first signs of the 2008 financial crisis).
- After 2006, adding REITs to a portfolio of stocks and bonds significantly increases VaR. The increase in VaR is even greater than it is when adding small stocks to the portfolio. The differences are significant at the 1% level.
- For a portfolio that already contains REITs (as a total-market fund would), adding additional weight to REITs further increases the VaR of the portfolio.

Stelk, Zhou and Anderson concluded that the “increase in extreme downside risk during the financial crisis has significant risk management implications for REITs in a mixed-asset portfolio.” They added: “Taken together, the results in this and previous studies do not dispute the long-run benefits of REITs, but they do raise questions about the role of REITs in a mixed-asset portfolio in times of financial crisis.”

Before concluding, we have one additional study to examine.

**The changing nature of REITs**

Stijn Van Nieuwerburgh, author of the April 2017 paper *Why Are REITs Currently So Expensive?*, used common asset pricing models to show that there have been important changes in the nature of risk priced into REIT markets. We can see that for ourselves using the regression analysis tool available at Portfolio Visualizer using AQR data.

We’ll examine the results for Vanguard’s REIT Index Investor Fund (VGSIX), the largest REIT fund
with assets of more than $60 billion. From June 1996 through December 2007, the fund had the following loadings: beta: 0.53; size: 0.38; value: 0.75; momentum: -0.05. The R-squared value of the model was 35%. However, from January 2008 through April 2017, the loadings shifted as follows: market: 1.02; size: 0.13; value: 0.46; momentum: -0.15. And the R-squared value rose to 59% (the explanatory power of the model greatly increased). Clearly, compared to prior periods, stock risk became much more important, while size and value risk became less important.

Van Nieuwerburgh himself noted that “the stock beta of equity REITs peaks at 1.75 for the 5-year periods that end around 2009-10.” In other words, consistent with preceding research, market risk for investors in REITs was increasing at exactly the wrong time. By the end of the period, the five-year market beta had fallen to 0.75, still well above historical levels.

Van Nieuwerburgh then looked at REITs' exposure to bond risk. He found that in addition to having larger exposure to market beta, the interest-rate risk of REITs rose sharply over the last decade. The 10-year Treasury bond beta surged from zero before 2005 to 1.5 by December 2016. This indicates that, at a time when many investors are concerned about the potential for rising interest rates, REITs are now subject to significant interest-rate risk.

Twin findings of a dramatically higher market beta and the huge jump in the 10-year Treasury bond beta mean that REIT investors are now subject to much greater risks than they historically experienced. And this comes at a time when both stock and bond (as well as REIT) valuations are at historically high levels—an inauspicious combination. It’s one thing to have lots of risk and high risk premiums resulting from low valuations, which was the case in early 2009 when equity valuations were low. It’s a very different thing to have high exposure to risks when valuations are high, and expected returns are therefore low.

Summary

Neither Kizer and Grover nor Stelk, Zhou and Anderson recommend excluding REITs from equity portfolios. Instead, their results should lead investors to conclude that REITs are an equity security with only marginal diversification benefits. Thus, they should not receive a weighting in investor portfolios greater than market-capitalization-based weights. According to data from Morningstar, REITs currently represent approximately 3.7% of the iShares Russell 3000 ETF (IWV) on a market-capitalization basis, which is a valid starting point for a REIT allocation in a diversified portfolio.

This is the approach we take at my firm, Buckingham Strategic Wealth. Because the equity mutual funds we utilize exclude REITs in their design, the allocation, typically about 3%, to REITs is accomplished through a separate allocation to a passively managed REIT fund, such as VGSIX. With that being said, given the evidence, and the increase in correlations to both stocks and bonds, investors concerned more about downside risk should consider reduced allocations to the asset class. This is especially true for investors with limited space in their tax-advantaged accounts, in which case REITs might crowd out investments with superior diversification benefits.

Over the long term, the real growth in REIT dividends has been about -0.7% (the NAREIT equity index produced $6.05 in dividend in January 1972 and $26.17 in May 2017, an annualized increase of
3.27% versus about 4.01% inflation). Currently, the SEC dividend yield on the Schwab U.S. REIT ETF (SCHH) is about 4.0%. Subtracting 0.7 percentage points from that figure provides a forecasted real return of 3.3%, which is about 2.8 percentage points greater than the current yield on 10-year Treasury Inflation-Protected Securities (TIPS). While no one knows what the future holds for REIT returns, at the very least, investors in REITs should be aware of the nature of these changes and their implications.

If REIT valuations remain unchanged, future returns are likely to prove disappointing. If either the risk premium investors require rises, or interest rates rise, less favorable outcomes will result. Of course, it’s always possible that risk premiums and/or interest rates will fall, leading to stronger than expected REIT returns.

At a minimum, investors need to recognize that REITs are now more vulnerable to an increase in interest rates and/or an economic contraction, and it’s important to stick to your plan, rebalancing along the way. If you have been thinking of increasing your allocation to REITs to generate more cash flow, the research I’ve covered and current valuations should serve as a cautionary warning. Forewarned is forearmed.

Larry Swedroe is the director of research for the BAM Alliance, a community of more than 150 independent registered investment advisors throughout the country.