

When a Safety Net Disappears

Occasionally — remember 2008? — diversification seems to fail, but such cases are so rare that the underlying principle should not be discarded.

BY CRAIG L. ISRAELSEN

ONE OF THE MAJOR AIMS OF ASSET ALLOCATION IS TO construct a portfolio with ingredients that don't all behave in exactly the same way. This low-correlation medley offers protection against the possibility that all assets will head south at the same time.

But, of course, that downside protection can be a double-edged sword; the portfolio's ingredients are also unlikely to all do well at the same time. While some of your funds will be winners, others will be relative losers.

That's the deal with a diversified portfolio; over the long haul, it works out well, but we have to be patient in the short run.

A common sentiment heard during the 2008 financial crisis was, "All correlations have gone to 1." While not exactly true, it was the case that correlations among a large number of asset classes increased in relation to large-cap United States stocks (as measured by the S&P 500) during the latter part of 2008.

We now have sufficient historical perspective to look back and examine where we were then and where we are now in terms of correlations among major asset classes.

In this analysis, the asset class against which all of the correlations will be calculated is large-cap U.S. stocks. The other 11 major asset classes that will be included in this analysis are shown in the table on this page.

As a reminder of the basics, the maximum correlation between two things

is either +1 or -1.

A correlation of +1 indicates that the two parts move up and down at the same time. A correlation of -1 indicates that the two parts behave very differently — when one moves up, the other always moves down.

Finally, a correlation of zero or closer to zero indicates that the behavior between the two portfolio ingredients is random — and that is the goal.

A DESIRABLE RANGE

We're generally happy when the correlation between the ingredients in a portfolio are in the range of -0.4 to +0.5. There will clearly be exceptions to that, such as the correlation between large-cap U.S. stocks and mid-cap U.S. stocks (which tends to be quite a bit higher than +0.5).

Studying correlation makes the most sense when we do it in the context of a diversified portfolio. This analysis uses the 12-asset model shown on page 49. The correla-

Asset Class	Representative Index
U.S. Large-Cap Stocks	S&P 500 Total Returns (Benchmark asset class against which correlation will be calculated)
U.S. Mid-Cap Stocks	S&P MidCap 400 TR
U.S. Small-Cap Stocks	S&P SmallCap 600 TR USD
Non-U.S. Developed Stocks	MSCI EAFE Net Returns USD
Emerging Markets Stocks	MSCI EM Gross Returns USD
Real Estate	DJ US Select REIT TR USD
Natural Resources	S&P North American Natural Resources TR
Commodities (Broad Basket)	Deutsche Bank Liquid Commodity Optimum Yield Diversified Commodity Index Excess Return
U.S. Bonds	Barclays US Aggregate Bond TR USD
TIPS	Barclays U.S. Treasury US TIPS TR USD
Non-U.S. Bonds	Barclays Global Treasury TR USD
Cash	US Treasury Bill 90 Day TR

tions were calculated over rolling 12-month periods starting on Jan. 1, 1998, and going through Nov. 30, 2016.

CALCULATING CORRELATIONS

The first 12-month correlation of large-cap U.S. stocks and mid-cap U.S. stocks was calculated from January 1998 through December 1998, and it was 0.96.

The correlation between large-cap U.S. stocks and small-cap U.S. stocks was calculated over those same 12 months, and it measured 0.97.

As shown in the chart “Portfolio-Level Correlations” on page 50, the average correlation between large-cap U.S. stocks and the other 11 asset classes during the first 12-month period was 0.39. Over the next 12-month period (February 1998 through January 1999), the average correlation in the portfolio was 0.39.

This same calculation was done for all the subsequent 12-month rolling periods through November 2016 (for a total of 216). The average portfolio-level correlation for this 12-asset model was 0.41 over the total 18-plus-year period.

But in the fall of 2008, it’s clear to see that the average correlation between large-cap U.S. stocks and the other 11 asset classes spiked much higher (see the circle within the graph).

In October 2008, every asset class in

this 12-asset model had significant negative monthly returns except for cash.

WEARING A SEAT BELT

This serves as a reminder of why we wear seat belts, and why we have cash in a broadly diversified portfolio.

October 2008 was indeed the time of a seismic event as measured by the correlation among the ingredients in this 12-asset portfolio.

Consider this: The rolling 12-month portfolio-level correlation was 0.39 as of September 2008. Then, one month later, the average correlation of the 11 assets classes to large-cap stocks jumped to 0.62.

Aggregate correlation within the 12-asset portfolio continued to increase over the next several months, and hit a high point of 0.7 in June and July of 2009. Since that time, correlation within the 12-asset model has declined.

In September 2015, correlation was down to 0.17. As of November 2016, the average correlation of the 11 asset classes to large-cap U.S. stocks was 0.48.

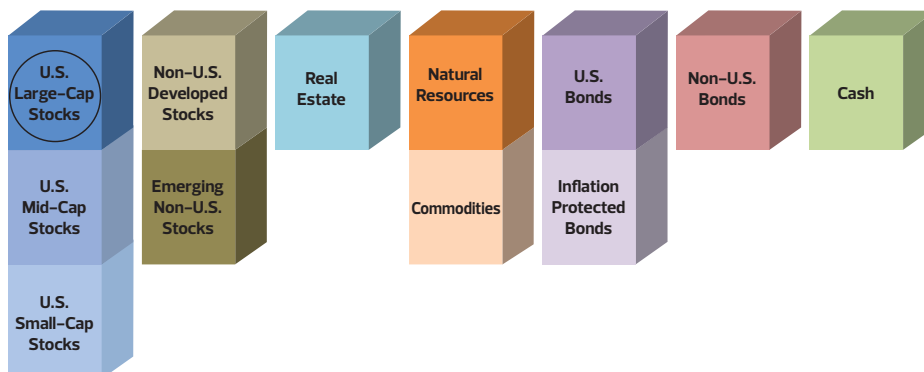
DEEPER VIEW

Let’s now examine the rolling correlations of each individual asset class with large-cap U.S. stocks for the two years before and after October 2008 (see the chart “Upward Pull” on page 51). It’s visually clear that cor-

October 2008 was indeed the time of a seismic event as measured by the correlation among the ingredients in this 12-asset portfolio.

12-Asset Class Model Portfolio

Each asset class is weighted equally at 8.33%



relations between large-cap U.S. stocks and the 11 other major asset classes were generally lower before October 2008 and higher afterward – except for cash.

Cash, by virtue of its consistently positive nominal returns, tends to have low correlation with large-cap U.S. stocks. Fixed-income asset classes also tend to have reliably low correlation with large-cap U.S. stocks. In October 2006, the rolling 12-month correlation between large-cap U.S. stocks and U.S. bonds was 0.21. Correlation was 0.09 with U.S. TIPS, -0.21 with non-U.S. bonds and -0.12 with cash.

By October 2008, the 12-month correlation had become 0.46 for large-cap U.S. stocks when paired with U.S. bonds, 0.46 with TIPS, -0.09 with non-U.S. bonds and 0.22 with cash.

By October 2010, the 12-month correlation of large-cap U.S. stocks with U.S. bonds was -0.38, and it was -0.06 with TIPS, 0.23 with non-U.S. bonds and -0.17 with cash.

We observed some upward fluctuation in the correlation between large-cap U.S. stocks and U.S. bonds and U.S. TIPS, but in general these fixed-income ingredients maintained their low correlation with U.S. large-cap stocks during this particular four-

year period.

By contrast, the correlation between large-cap U.S. stocks and the other equity ingredients started fairly high and went higher. Indeed, in October 2006, the 12-month correlation between large-cap U.S. stocks and mid-cap U.S. stocks was 0.84, and it was 0.78 with small-cap U.S. stock, 0.63 with non-U.S. stocks and 0.77 with emerging stocks.

In October 2008, the 12-month correlations had jumped to 0.98 with mid-cap stocks, 0.96 with small-cap U.S. stocks, 0.92 with non-U.S. stocks and 0.85 with emerging stocks. As of October 2010, the 12-month correlation between large-cap U.S. stocks and mid-cap U.S. stocks remained high at 0.96, and it was 0.91 with small-cap U.S. stocks, 0.9 with non-U.S. stocks and 0.92 with emerging stocks.

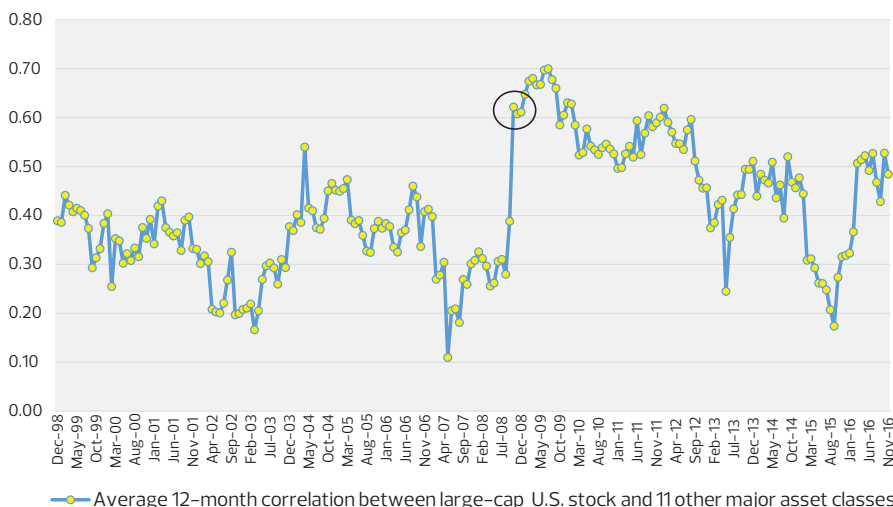
The 2008 financial crisis serves as a reminder of why we wear seat belts, and why we have cash in a broadly diversified portfolio.

THE DIVERSIFIERS

Among the diversifier asset classes, the 12-month correlations with large-cap U.S. stocks as of October 2006 were relatively low: 0.57 for real estate, 0.34 for natural resources and -0.03 for commodities. By October 2008, those correlations had risen to 0.84 for real estate, 0.72 for natu-

Portfolio-Level Correlation

Average 12-month correlation of 11 major asset classes with large-cap U.S. stocks



Source: Steele Mutual Fund Expert software, calculations by author

ral resources and 0.53 for commodities. At the end of October 2010, they were even higher: 0.87 for real estate, 0.95 for natural resources and 0.87 for commodities.

As of November 2016 (not shown in "Upward Pull"), 12-month correlations between large-cap U.S. stocks and the other U.S. equity asset classes were still high (0.96 with mid-cap stock and 0.92 with small-cap stocks).

Encouragingly, the correlations between large-cap U.S. stocks and non-U.S. equity had declined somewhat (0.79 between large-cap U.S. stocks and non-U.S. stocks, and 0.68 between large-cap U.S. stocks and emerging stocks).

The diversifiers are doing their job better now (0.67 correlation between large-cap U.S. stocks and real estate, 0.64 with natural resources and 0.23 with commodities).

Finally, as of November 2016, U.S. bonds

had a 12-month correlation with large-cap U.S. stocks of -0.07, and 0.1 for TIPS, 0.1 for non-U.S. bonds and 0.32 for cash.

While it's important to consider the correlation of each ingredient with every other portfolio ingredient, we can also get an overall sense of the aggregate portfolio correlation by simply calculating the correlation of each portfolio ingredient with large-cap U.S. stocks.

Did correlations all go to 1 in the fall of 2008? No, not if measuring correlation over rolling 12-month periods at the portfolio level.

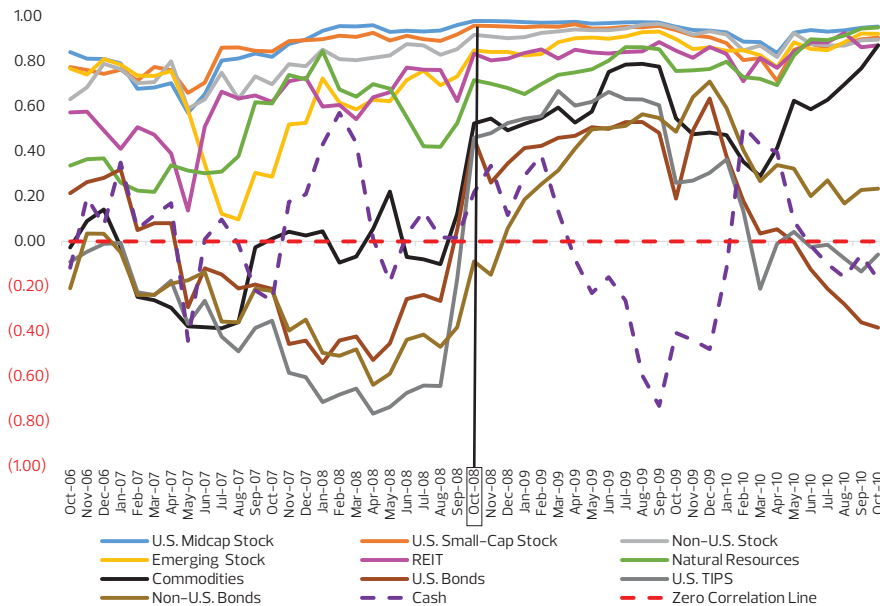
Just as performance tends to regress to its mean, portfolio-level correlation tends to do the same. One key message from this analysis is that although portfolio-level correlation increased in 2008 and 2009, that is not a reason to abandon the core investing tenet of diversification.

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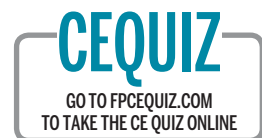
There may be short-term seismic events, but over time portfolio-level correlation tends to regress to the mean.

Upward Pull

Rolling 12-month correlation of major asset classes to large U.S. stocks two years before and after October 2008



Source: Steele Mutual Fund Expert Software, calculations by author



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