

# THE PORTFOLIO

DIVIDEND STOCKS + BACK TO BASICS

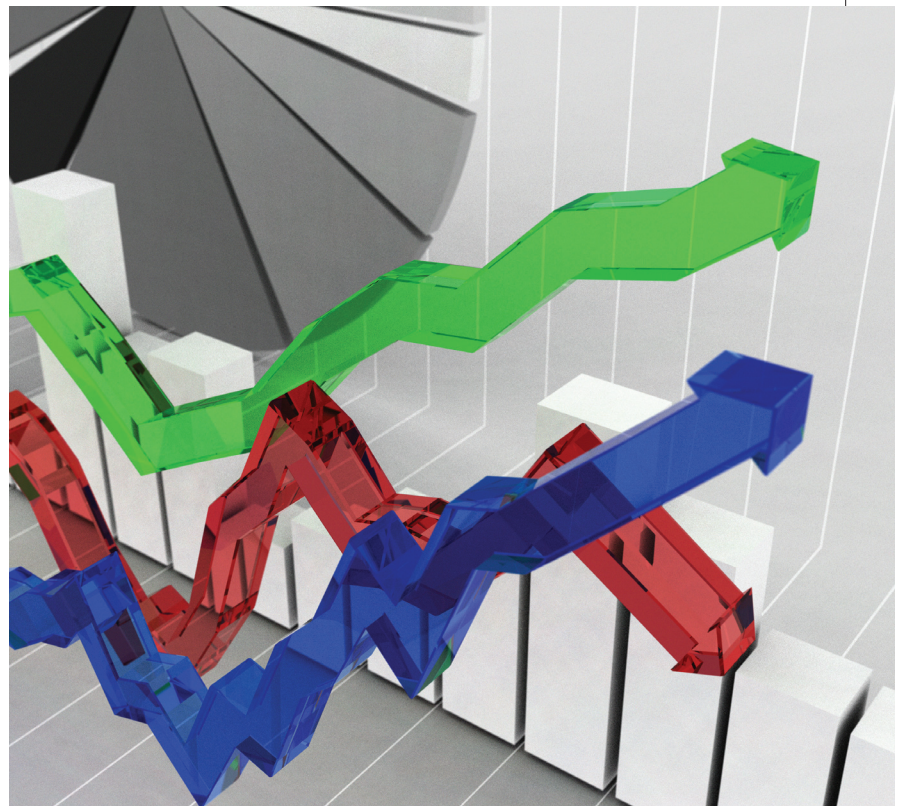
## All Together Now

*Analyzing correlation patterns shows that some assets are not providing hoped-for diversification.* By Craig L. Israelsen

TO REDUCE THE VOLATILITY OF returns in a portfolio, planners combine assets that tend to have low correlation to one another. There are many examples of the importance of low correlation. For example, a basketball team needs players with different attributes and talents—the team must be diversified. Building a basketball team with five point guards is not a great idea, as much as we value point guards. A center is needed, as well as several forwards. Because they have different attributes and talents, the correlation between point guards and power forwards is low—and low correlation is what we're after.

Low correlation equals diversification. Economics professor Harry Markowitz summarizes the basic premise underlying diversification and portfolio asset allocation in a simple sentence in *Portfolio Selection*: "To reduce risk, it is necessary to avoid a portfolio whose securities are all highly correlated with each other." It is assumed that Markowitz was equating the term "risk" with volatility of returns. In addition, financial theorist William Bernstein observed in *The Intelligent Asset Allocator* that "the concept of correlation of assets is central to portfolio theory—the lower the correlation, the better."

The maximum correlation between two parts of a system is +1.0 (or 100%), and the minimum correlation is -1.0 (or -100%). A correlation of +1.0 indicates that the behavior of



the two parts is quite similar (i.e., two twin brothers who both play point guard). A correlation of -1.0 indicates that the two parts behave in opposite manners (i.e., a left-handed 6'1" point guard and a right-handed 7'4" center). A correlation of zero indicates that the relationship between the behavior of the two parts is basically random.

As it pertains to investment portfolios, correlation between two assets within a portfolio is measured in the range of -1.0 to +1.0, where -1.0 indi-

cates that the price movement of two assets is perfectly inversely related. When one goes up, the other goes down, and vice versa. A coefficient of zero indicates no correlation between the assets, while a coefficient of +1.0 indicates perfect positive correlation. When one goes up, the other goes up.

The correlation goal for a multi-asset portfolio is zero. That goal means that the average correlation between all the assets in the portfolio should hover near zero. It's

difficult to achieve consistently in actual practice, but we need to have a stated goal. A more pragmatic goal would be to build a portfolio in which the aggregate correlation among all the various assets is in the range of 0.30 to 0.40.

Interestingly, many of the asset classes that we tend to think of as “hedgers” to large domestic equity—small-cap equity, non-U.S. equity, real estate and even commodities to a certain extent—have recently been more positively correlated. Cash and bonds remain better choices for diversification, but correlation is not the only key to a successful portfolio. The trick is to balance correlation and performance, while remembering that correlation is not a static number but one that changes over time.

**CORRELATION PATTERNS**

This article examines the patterns of correlation between seven core investment asset classes: large U.S. equities, small U.S. equities, non-U.S. equities, bonds, cash, real estate investment trusts (REITs) and commodities. These seven assets have performance histories that go back to 1970. This article examines the most recent 20-year period from Jan. 1, 1989, to Dec. 31, 2008.

Here are the indexes that were used as a proxy for each asset class:

- Large-cap U.S. equities: S&P 500 Index
- Small-cap U.S. equities: Russell 2000 Index
- Non-U.S. equities: Morgan Stanley Capital International EAFE Index (Europe, Australasia, Far East) Index
- U.S. intermediate-term bonds: Lehman Brothers Intermediate Government Bond Index (now the Barclays Capital Intermediate Govt. Bond Index)
- Cash: 3-month Treasury bills
- Real estate: Dow Jones Wilshire REIT Index
- Commodities: Goldman Sachs

**UNUSUAL TIMES**

Although commodities appear to be the least correlated asset class with large stocks, the correlation spiked to 0.60 in the last few months of 2008—the highest correlation in the past 20 years.

**LARGE STOCKS, AVERAGE 12-MONTH ROLLING CORRELATIONS, 1989-2008**

Asset Class	Correlation
Small Stocks	0.76
Non-U.S. Stocks	0.65
Intermediate Bonds	0.08
REITs	0.41
Cash	0.01
Commodities	-0.03

Source: Principia (raw data)

Commodities Index (GSCI). As of Feb. 6, 2007, the GSCI became known as the S&P GSCI.

Let’s assume that the core asset class in most accumulation portfolios (that is, portfolios of individuals who are preparing for retirement) is large-cap U.S. stocks, specifically large-cap U.S. mutual funds. In order to achieve a diversified overall investment portfolio, we need to find several other assets that are different from U.S. large-cap funds. A common next step is to add small-cap U.S. stocks to diversify the large-cap stock-based portfolio.

That’s a fine idea because of the long-term performance advantage of small caps. But unfortunately, adding small-cap stock funds to large-cap funds does not produce the level of diversification needed. Over the 20-year period from Jan. 1, 1989 to Dec. 31, 2008, the average correlation between large-cap and small-cap U.S. stocks averaged .76 and never strayed too far from that number. However, in recent years the correlation of rolling 12-month returns has been at or above 0.80. During the year of 2008, the correlation between the two was 0.96.

Large-stock funds and small-stock funds still belong in the same portfolio, of course. But combining large-cap equities and small-cap equities will not create a well-diversified portfolio because the return patterns of these two assets are too similar.

How about using non-U.S. stocks as a diversifier for large-cap stocks? During the 1990s, that worked fine. But there has been a steady increase in the correlation between these two assets in recent years. In fact, the average 12-month rolling correlation between the S&P 500 and the MSCI EAFE during the first 10 years of this test period (Jan. 1, 1989 to Dec. 31, 1998) was 0.49. During the past 10 years (Jan. 1, 1999 to Dec. 31, 2008), it was 0.80. That’s a problem when trying to diversify by adding non-U.S. equities to a U.S. equity-based portfolio.

So should a portfolio contain large U.S. stocks, small U.S. stocks and non-U.S. stocks? Certainly. The performance potential of each asset warrants its inclusion. However, these three equity-based assets will not generate a low-correlation portfolio.

**BETTER CHOICES?**

To this point, our portfolio has only included equity components. We need to include fixed-income assets. Intermediate-term U.S. bonds tend to have a low correlation to large U.S. stocks. The average 12-month rolling correlation since 1989 has been 0.08. However, it has been a fluctuating pattern. During the first 10 years (1989-1998), the average correlation was 0.41, and during the last 10 years (1999-2008) it has fallen to -0.23. Bonds are an excellent diversifier in an equity-based portfolio. However, it shouldn’t be surprising if the correlation between these two assets rises in the future—just as the pattern of the past has illustrated.

Some may argue that young investors don’t need diversified portfolios.

They should just load up on equities and attempt to crank out the highest possible return. This approach blithely assumes that people don't react badly when highly correlated equity assets all tank during a bear market. Diversification tends to stabilize the return pattern of a portfolio, which keeps investors in the saddle. In the end, a well-diversified portfolio will generate satisfactory returns, although during buoyant bull runs it will lag behind an all-equity portfolio.

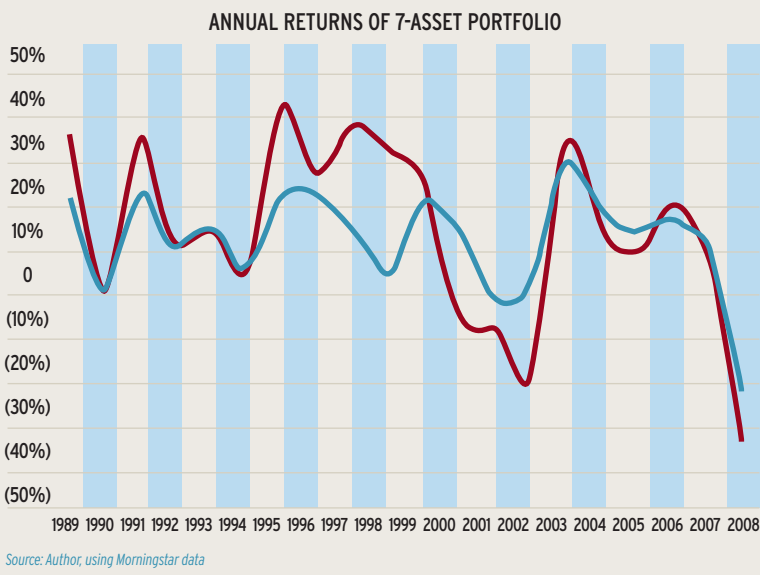
How about cash as a diversifier for large-cap U.S. stocks? It's a great equity diversifier. The average 12-month rolling correlation between large stocks and cash between 1989 and 2008 was 0.01. A two-asset portfolio of large-cap stocks and cash fulfills the goal of a zero correlation portfolio.

However, having low portfolio correlation should not jeopardize performance. For example, over the 20-year period from 1989 to 2008, a two-asset portfolio consisting of 50% large U.S. stocks and 50% cash (annually rebalanced) had an average annualized return of 6.89% compared with a return of 8.3% for a two-asset portfolio comprising 50% large stocks and 50% small stocks. The difference, of course, is reduced volatility in the stock/cash portfolio. Its worst one-year return was -17.7% (in 2008) compared with a -35.4% in the large-stock/small-stock portfolio (which also occurred in 2008).

There are two more distinct asset classes: REITs and commodities. The correlation pattern between U.S. large stocks and REITs tends to be positive and in the average range of 0.40. Over the past three to four years, the correlation between real estate and large stocks has been increasing. In fact, the 12-month correlation of the monthly returns between the two during 2008 was 81%. This doesn't mean that we abandon REITs in a portfolio. Rather, we simply recognize that the correlation between REITs and large U.S. stocks is currently higher than normal and that

## THE THIN BLUE LINE

The annual returns of the 7-asset portfolio (the blue line) had about half the volatility of a portfolio consisting of only the S&P 500 over the past 20 years.



the relationship between the two will eventually regress to its mean.

Commodities are one asset with a low correlation to the S&P 500. The average rolling 12-month correlation since 1989 has been -0.03. However, the correlation spiked to 0.60 in the last few months of 2008—the highest correlation in the past 20 years. As with REITs, the relationship between commodities and large stocks is currently at the top of its historical range (at least over the past 20 years). This isn't a time to dump commodities simply because the correlation with stocks is higher. A pattern of fluctuation in the correlation is clearly evident since 1989.

### BENEFITS OF BLEND

Last, we examine the average correlation among all seven assets blended together in a diversified portfolio (see [www.7TwelvePortfolio.com](http://www.7TwelvePortfolio.com) for more information on this portfolio). There are a total of 21 pair-wise correlations in a seven-asset portfolio. The average correlation among the 21 pairs of assets was an impressive 0.31.

Achieving low correlation among the various ingredients of a portfolio is not the sole goal, of course. However, it is an important objective in achieving a smoother pattern of returns. As "The Thin Blue Line" (above) shows, the annual returns of the seven-asset portfolio (the blue line) had about half the volatility of a portfolio consisting of only the S&P 500 over the past 20 years. Moreover, the 10-year annualized return of the S&P 500 between 1999 and 2008 was -1.4% compared with 5.1% for the seven-asset portfolio. Smoother returns often equal better long-term results, and to create smoother returns, create a portfolio with assets that have low correlation to one another. **FP**

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