WHITE PAPER

Dynamic Asset Correlations During Times of Market Stress

For Consideration in Portfolio Construction

Diversification Challenges

Correlation is a common metric portfolio managers use to help plan for the effects of adverse market moves. Generally, correlation describes the movement of an asset's return in relation to another asset. The goal of asset allocation is to combine various assets that behave in opposite or unrelated ways to mitigate the risk of one asset declining in value.

Ideally, when one asset goes down, an uncorrelated asset will increase or hold value, buoying a portfolio's performance. Historical correlation is not always static through time, however. Periods of market stress can cause movements of otherwise un- or low-correlating assets such as stocks and bonds to synchronize.

This potential loss of diversification during times of market stress is potentially destructive to a financial plan. Correlation is an important consideration when diversifying assets, but the change in correlation must be considered as well.

Correlation and Its Role in Portfolio Diversification

Asset correlations can range from -1 (perfect negative correlation) to +1 (perfect positive correlation). As an example, between two assets A and B, a correlation of +1 indicates that the return of A exactly mirrors that of B. A real world instance of this is the S&P 500 ETF SPY that exhibits nearly perfect positive correlation with the S&P 500 index at 0.998.

S&P 500 vs SPY Total Returns

*Using monthly prices. Source: www.yahoo.com/finance
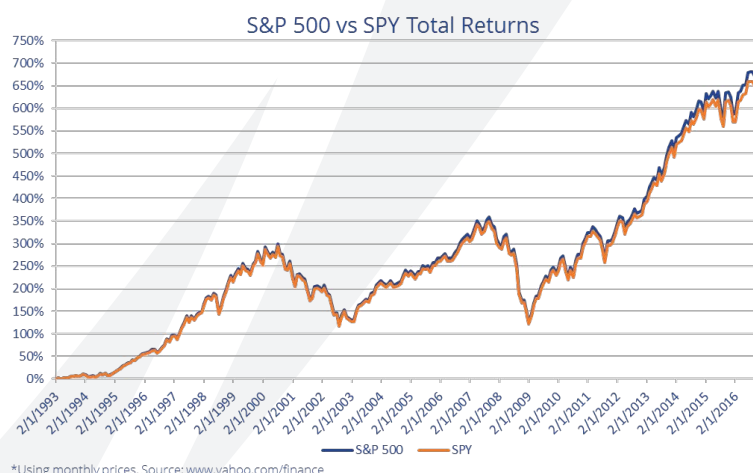
Conversely, a correlation of -1 means that for every positive return in asset A, there is an equal negative return in asset B. A correlation of 0 signifies no discernible relationship between the returns of A and B. Finding assets with no relationship is the goal of diversification in the

portfolio construction process so that even if asset A declines, asset B may still increase or at least hold value.

Discontinuity of Long-Term and Stress Correlations

The most common asset mix in a portfolio is the combination of stocks and bonds. Bonds do not return as much as stocks, but holding them is justified based on their stability and low correlation to equities. Lower returns are acceptable as long as bonds hold up in value when stocks sell off.

The issue is this is not always the case. In times of exaggerated market stress, correlation can deviate from long-term levels decreasing the diversification benefit that was the justification for holding the asset in the first place.

The 2007-2009 financial crisis provides a strong example of this phenomenon. Investors largely exited all positions in lieu of cash during the crisis until conditions

stabilized. This "flight to safety" caused obvious return declines in equities, but also led to losses in other diversifying asset classes. Correlations between stocks and bonds increased resulting in the loss of diversification between the two asset classes. The investment grade US bond ETF AGG most notably saw an almost ninefold increase in correlation to SPY from 4.7% to 41.0%.

Correlations With SPY

Asset Class	ETF	Since Inception	2007-2009 Financial Crisis
Investment Grade US Bonds	AGG	4.7%	41.0%
Commodities	GSG	50.1%	56.5%
Int'l Equity	EFA	74.2%	91.5%
Emerging Markets	EEM	79.4%	85.3%
REITs	VNQ	73.5%	82.0%
High-Yield US Bonds	HYG	72.9%	73.8%

*Using monthly prices and financial crisis dates of 10/31/2007-2/27/2009. Source: www.yahoo.com/finance

This asset, traditionally viewed as an equity diversifier, lost its diversification utility at a time when investors needed it the most. The same correlation adversity is evident in other diversifying asset classes as well, such as commodities, international equities, emerging markets, REITs, and high-yield US bonds.

Dealing with Dynamic Correlation's Effect on Returns

In order to account for periods of rising correlation, assets should be chosen for a portfolio on the basis of dynamic rather than long-term correlation. The ideal diversifying security would correlate perfectly to equities during bull markets, and exhibit perfect negative correlation during bear markets.

Such an asset obviously does not exist (if it did no one would invest in anything else), but there are assets for which dynamic correlations go from zero to negative in times of market distress, rather than zero to positive.

Managed futures is an alternative asset class with the freedom to long or short a variety of asset classes depending on market trends. Trend-following managed futures funds systematically view long-, mid- and short-term momentum signals to determine which asset classes to long and which to short. The SGCTA is the benchmark for this group of funds and it demonstrates the diversification capabilities of managed futures. While the benchmark's long-term correlation to SPY is -0.139, it's correlation declined significantly to -0.402 during the financial crisis. Managed futures lag the S&P 500 during normal times, similar to bonds, but proved their worth during the financial crisis moving in the opposite direction of stocks, unlike bonds.

Rolling 90 Day Correlations to SPY
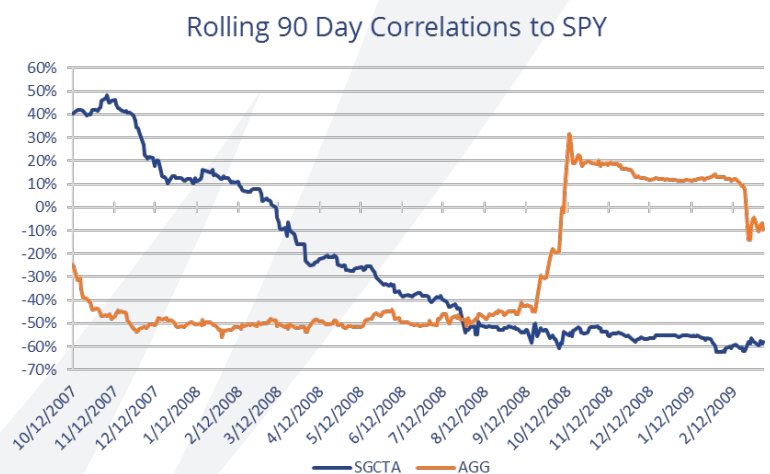
*Using daily prices. Sources: www.yahoo.com/finance and www.barclayhedge.com/research/cta-indices.html

Comparing the traditional 60-40 asset mix to a portfolio that adds a 20% managed futures component, taking 10% each from stocks and bonds, results in a portfolio with a more attractive risk-return profile. The portfolio with the managed futures performed better during the

financial crisis by 6.5%, offsetting equity losses better than the traditional 60-40 portfolio.

Growth of $100 K During 2007-2009 Financial Crisis

Allocation	Return	Final Value
60% SPY, 40% AGG	-31.8%	$ 68,189.03
50% SPY, 30% AGG, 20% SGCTA	-25.3%	$ 74,731.49
SGCTA Outperformance	6.5%	$ 6,542.46

*Using monthly prices, 90 day rebalancing, and financial crisis dates of 10/31/2007-2/27/2009. For illustration purpose only. Past return is no guarantee of future performances. Sources: www.yahoo.com/finance and http://www.barclayhedge.com/research/cta-indices.html

Summary

Correlation describes the movements of asset classes in relation to one another, and is an important consideration when making informed asset allocation choices. Investors' attempts to diversify their portfolios based on long-term correlation using a traditional mix of stocks and bonds is well intentioned but, at times, may provide an insufficient level of diversification when correlations converge, as they did in 2008.

For investors looking for uncorrelated assets in their portfolios, managed futures may do a better job offsetting losses during market sell-offs, as they have the ability to go both long and short a wide range of asset classes and have a track record showcasing this ability.

By developing a superior investment choice set founded on the principles of dynamic asset correlation, investors and managers are better positioned to select other asset classes (such as managed futures) in addition to stocks and bonds in the portfolio construction process. Diversifying between assets that are chosen based on their dynamic asset correlations to one another, produces a portfolio that is more capable of meeting investment goals during many different market environments.

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