

Focus: Correlation

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As recent history has shown, the impact of unstable correlation between assets in a portfolio can be devastating

The Challenger space shuttle blew up in mid air because of a defective 'O-ring', a tiny but in hindsight very important part of the overall system. Stability of correlation could be called the O-ring of portfolio management, but to date, very little attention has been paid to it.

Last year, the investment tide went out, leaving portfolios exposed to previously unseen risks. Investors were left dazed and bruised. They were upset not because the markets went down - most people expect that at some time in their life - but because they were promised portfolio diversification would buy them a free lunch.

The promise to investors was as follows: if you invest in alternative assets or private equity, which are relatively uncorrelated to your main portfolio, you should be relatively unaffected in periods of risk aversion. But the sad reality was that the correlations academics assumed to be stable were in fact unstable. When the crisis broke, all assets went down together and correlations veered towards one.

Investors had generally assumed more risk than normal in the belief that diversification would shield them from significant losses. During the crisis they suddenly realised, therefore, that not only were they a lot more exposed than they previously thought, but they had also assumed too much risk. How did they respond? They did what any investor would do in the face of a serious, previously unknown risk – they panicked and switched to known liquid assets like cash and treasuries.

Investors are now understandably reluctant to return to their previously 'uncorrelated' assets. Fund managers must ask searching questions in order to reassure investors that they can construct 'all-weather' portfolios. Such questions as: why were the correlations not stable?

Every asset has a characteristic correlation to the global market portfolio (GMP - a generic traditional portfolio), which can be highly unstable. Not many investment managers thought to look at how unstable the correlations were in their portfolios.

Second, if alternative assets have low correlation in good times but tend to have high correlation in periods of risk aversion are they worth having in a portfolio? The most obvious answer to this has to be no: if they do not provide the benefits of diversification when you need them, they are not worth the higher fees.

Third, why is the 'stability of correlation' not even monitored in portfolios?

Like the O-ring in the space shuttle, very few portfolio managers even knew a problem potentially existed, making it very difficult to monitor. It is, however, possible to monitor stability of correlation. Every asset will have a correlation 'footprint' - a signature behaviour

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in various market conditions. If an asset tended to correlate very strongly with the global market portfolio in previous periods of risk aversion like 1987, 1998 or 2001, then it is likely it will repeat that pattern.

One can also use the familiar statistical methods to measure how volatile the correlation is. A correlation with a high standard deviation from its mean is likely to be less reliable than one that displays very little instability.

An analysis of correlation and stability of correlation shows that assets can be classified into four categories, depending on their usefulness as a portfolio diversifier.

The first category can be labelled 'non-diversifiers'. These are assets that have a high and stable correlation to the global market portfolio, and are therefore of very limited use as a diversifier. These assets move in lockstep with most portfolios and, unless they have significant cost or liquidity advantages, they should not be used in a portfolio for diversification.

'Pseudo-diversifiers' come next. These are assets that pose as low-correlation assets but tend to become highly correlated in risk aversion periods, making them unsuitable as a portfolio diversifier.

In fact, they are positively dangerous in a portfolio as they give the illusion of diversity. Many hedge and private equity funds were in this category last year. Unfortunately, this is the hole into which most investors unwittingly fell.

The third category is 'real diversifiers' - assets with a low or negative correlation to the global market portfolio that does not tend to move significantly, even in risk aversion periods. Bonds come to mind immediately.

Another example would be a hedge fund that buys or sells hurricane risk insurance. Their correlation to the GMP will be low, as there is little correlation between hurricanes and risk aversion periods (readers might recall the hurricane in London just before the 1987 crash, but that is widely considered coincidental). An investment of this type will be a good diversifier for a portfolio, as it will not be affected by financial markets.

Finally, there are 'super-diversifiers'. These are assets that tend to be correlated when the GMP is going up, but tend to become negatively correlated in risk aversion periods. These are called super-diversifiers because they are ideal portfolio investments. They tend to make returns along with the GMP and, when a risk aversion period comes, they tend to become negatively correlated and keep on making returns while the GMP is losing money. An example of this would be a volatility fund that adopts a barbell options strategy.

This strategy consists of buying long-dated, out-of-the-money puts and calls on different asset classes. Should any asset class trend strongly in one direction or another this strategy should catch it. As down markets tend to move faster and volatility is generally negatively correlated to the underlying asset, the best returns will result during risk aversion periods, especially when all asset classes move in tandem. This is the very time you want positive returns. The only problem is that these kinds of funds are like black swans – relatively scarce.

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The lessons can now be learnt. Portfolio managers should review the assets in their portfolio with reference to each asset's correlation stability. Assets that display high correlation in risk aversion periods generally have very little diversification benefits and therefore should be earning higher returns per unit of risk to justify their place in a portfolio. Assets that do not justify their place in this way should be removed from a portfolio.

Managers also have the ability to check correlation stability before the assets are included in the portfolio. Assets with poor correlation stability characteristics should be weeded out in the filtering process of asset selection. Assets with stable or favourable correlation characteristics should be promoted.

Investors can then be reassured that their investment managers are seeking out genuine diversifiers to include in their portfolios. This really is the free lunch that was promised after the bear market early this decade.

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