

Pensions & Investments

2008 revealed flaws in modern portfolio theory

By: Richard Haworth

Published: September 20, 2012



Jerry Haworth

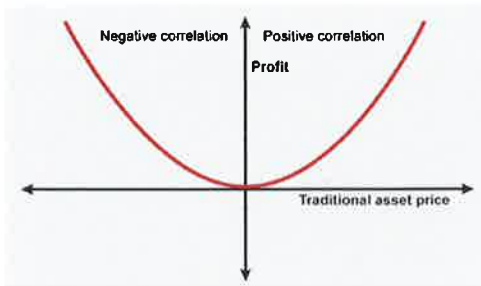
2008 is a terribly misaligned year. It is the “annus horribilis,” the year everything in finance went wrong. But instead of complaining about it, we should be quietly celebrating it.

There are many reasons to celebrate 2008 — mostly because it highlighted the dangers of everyone slavishly following modern portfolio theory with its deceptively flawed assumptions of constant volatility and correlation. By ignoring what we call “the evil twins” of correlation and volatility, the theory simply ignored grave potential dangers.

The first “evil twin” is volatility of correlation (i.e. the correlation itself is not stable). Just as you can have good and bad cholesterol, so, too, can you have good and bad unstable correlation. We all witnessed bad unstable correlation in 2008. Prior to this, our portfolios looked diversified and stable and we focused on relative risk/returns to generate an efficient portfolio. Then, as the systemic crisis unfolded, hitherto uncorrelated asset returns began to move together, correlations tended to one and the protection promised by traditional diversification, as preached by modern portfolio theory, failed.

But there is a “good twin”: favorable instability of correlation. This is displayed when an asset's correlation tends to -1 (i.e. the more unstable the asset's correlation becomes, the more uncorrelated the asset becomes vis-à-vis the portfolio). This is a very good characteristic as the more negative the traditional asset's performance is, the more positive the uncorrelated asset's performance becomes, therefore providing portfolio protection.

Exhibit 1: Correlation of long dated, out of the money options.



36 South Capital Advisors LLP

Correlation of long date, out of the money options

An example of such an asset is long dated out-of-the-money put options, which generally display negative correlation. When correlation becomes unstable it is normally to the downside and the put option's correlation becomes much more negative and tends to -1. Its returns display positive convexity as traditional asset returns become more and more negative (and correlated).

The second “evil twin” is volatility of volatility (i.e. volatility that becomes unstable when asset returns are going down). Once volatility becomes unstable, it is generally to the upside, which in turn is generally associated with negative asset returns.

Investors face multiple problems once volatility of volatility rises:

- 1) When specific cash flows from selling a security are needed at a set future date, higher volatility means a greater chance of a shortfall.
- 2) The higher the volatility of returns while saving for retirement, the more uncertain final portfolio values are.
- 3) Higher volatility of return when retired gives withdrawals a larger permanent impact on the portfolio's value.
- 4) As volatility increases, the ability to adjust a portfolio timeously diminishes.
- 5) Large movements in volatility cause our irrational fears and biases to emerge and lead to irrational actions in our portfolio.
- 6) As volatility rises, the ability to adopt leverage diminishes.

Again there is a “good twin,” volatility of upside volatility (i.e. volatility that increases as asset returns increase). We have not yet heard of anyone complaining of returns rising too quickly!

This all leads to two obvious questions:

- 1) Can we forecast it?

2) What actions can we take to minimize these dangers?

Forecasting times of uncertainty and unknown events is by definition impossible. At best we can get an inkling that the system is fragile, thus making it more vulnerable to shocks (i.e. the mortgage crisis could be called a "gray swan" as it was predicted by quite a few people).

This has portfolio implications; we must have "pre-bought" any antidote for the malaises described above before it happens.

What can be done about it? Include assets/funds in the portfolio that:

- tend to -1 correlation as traditional asset correlation tends to 1 (i.e. they make their best returns when most other assets are making their worst);
- profit from both rising volatility and the rising volatility of volatility; and
- display convexity; the ability to snowball these attributes so that the worse the correlation and convexity characteristics of traditional assets become, the better the characteristics of these assets become.

What assets are we talking about? Options, specifically long dated out-of-the-money options. A portfolio that buys these, ideally across asset classes, would be long convexity, long volatility and have a correlation footprint that tends to -1 in a systemic crisis. This correlation can be positive and make returns alongside traditional assets in bull markets and then switch to negative automatically when asset prices fall, therefore making great returns in environments such as 2008.

These funds are the most suitable diversifiers in a traditional portfolio to hedge against risks not addressed by modern portfolio theory (i.e. the "evil twins," instability of correlation and volatility of volatility).

Long volatility funds require considerable expertise to run as multiasset class derivative experience is required. There are funds in this area that have proven themselves over many years and, undoubtedly, there will be more good managers coming through as financial crises and volatility events highlight the need for these funds in traditional portfolio management.

Richard "Jerry" Haworth is co-founder and chief investment officer at 36 South Capital Advisors LLP, London.