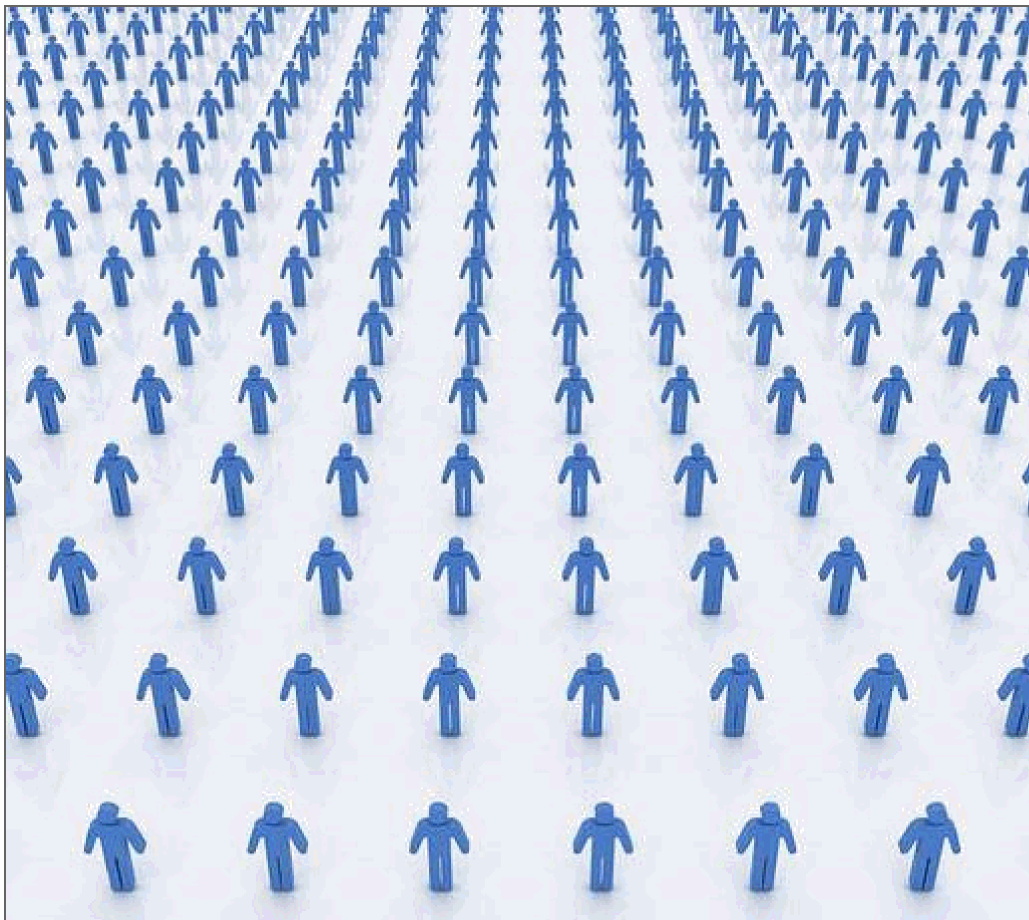


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The correlation game - the search for real diversification



After a crisis which saw even well diversified portfolios punished, what now for investors?

During the last decade UK institutions have diversified across an ever-increasing range of asset classes in an effort to protect portfolios from downside risk. The subsequent shock delivered by higher than expected cross-correlations and plummeting returns as markets fell, has re-opened the diversification debate.

However, even though it is easily said with hindsight, increased correlation among risky asset classes in falling markets is not a new phenomenon. As far back as the 90s experts were warning that correlations changed in different market environments. Furthermore, the same thing happened in the 2000 market crisis. Although that bear market was not as

severe, and investors were better able to weather the storm, the warning signs were there. To some degree, higher correlations are common sense: as investment becomes - increasingly globalised with ever-more money pouring into asset classes considered alternative, or even frontier, it is little surprise those assets become hostage to the same emotions and forced selling as mainstream investments. Since January 2000, for example, emerging market equity and debt funds tracked by EPFR Global have seen inflows of \$266.2bn and \$72.3bn respectively. Commodities funds have seen \$81.3bn.

When markets are rattled and investors move into a risk-off mind-set, fleeing to quality assets, it is obviously risky assets that are hit, thereby increasing cross-correlations in downward markets.

According to Ed Peters, Co-Director of Global Macro at investment boutique First Quadrant: "The higher correlations experienced during the current market crisis should have been foreseen to a greater extent than they were. The statistical analysis was there, but it was not necessarily understood completely. It was a classic case of having enough knowledge to be dangerous."

While most sophisticated investors were well aware correlations rose at times of market distress, it was the scale of the contagion that caught many by surprise.

The relationship between volatility and correlations is not linear and correlation is considerably harder to predict. The situation is considerably exacerbated by factors like forced selling and leverage, whose existence is hard to identify and therefore quantify, but whose impact is inevitably greater as global investment becomes increasingly intertwined.

The demise of the quants

The toxic effect of leverage was painfully demonstrated by the incredible demise of the quants in the first few weeks of August 2007, as a few high-levered equity market neutral funds were forced to rapidly unwind, causing billions of losses, even among some of the most reputable names. Few could really guess at the overall degree of leverage in the system leading up to the crash. Because of the invisible nature of leverage, quant managers had little clue how sensitive they were to each other.

Throughout the crisis between October 2007 and March 2009, emerging and developed equity market correlations increased significantly. According to figures from Global Asset Managers, correlations of emerging market equities versus the S&P500 increased nearly 20% to 0.865 from 0.722 between 2000 and the onset of the crisis. For emerging Asia, the increase was even more marked, jumping 35% from 0.627 to 0.848.

"One of the key lessons of this crisis is correlations are not stable and uncertainty about future correlations has increased. It is one of the least predictable variables in the financial markets," says Valentijn van Nieuwenhuijzen, head of strategy at ING Investment Management.

The new reality

Unsurprisingly, there has been a raft of recent research analysing the new reality for the investment environment, focusing on more in-depth and informed analysis of correlations based on painfully learnt experience.

Historically analysis predominantly focused on long-term correlations, but that incorrectly assumes correlations are stable by not accounting for changes during the market cycle. Now, more attention is being paid to different market environments. High and low volatility periods, or 'regimes' as they have become known, are being looked at in greater detail. The VIX index, commonly used as a barometer of market fear, usually reverts to a mean of around 20% and therefore periods of over 20% are considered high volatility regimes. Research from First Quadrant between January 1988 and October 2008 shows that correlations of risk assets such as emerging market equity and bonds versus the S&P500 increases significantly in times of stress. ([see chart](#))

The diversification benefit of investing across risky asset classes, which are exposed to the same fundamental risk factors as equity, therefore changes over the market cycle, - disappearing in down markets, exactly when investors need the "protection" of - diversification most.

'Safe' assets such as 10 year US treasury notes, on the other hand, show a greater negative correlation to equity in times of stress.

"This is a crucially important lesson for optimising portfolio diversification and should be the cornerstone of the investment process," van Nieuwenhuijzen said. "The biggest protection against negative returns is to make a clear distinction between safe and risky assets, which should provide greater benefits of diversification in a crisis."

Most importantly, the definition of 'safe' assets is very narrow, really only incorporating certain developed market sovereign bonds. "Some precious metals could also arguably be included," van Nieuwenhuijzen adds. "However, all corporate credit and some emerging sovereign debt also belong in the risky bucket as they are highly correlated to equities in crisis periods," he said. Crucially, correlation of risky assets is a-symmetrical. In bull markets, correlations between risky assets generally decrease, but in extreme market downturns, the opposite is true. Taking BBB corporate bonds as an example, during periods of recovery when the S&P500 returns over 6%, correlation is negative at -0.3. However, in times of market distress when the S&P500 returns less than -6%, correlation jumps to 0.25. Emerging market bonds, one asset class currently gaining popularity, show correlations of -0.25 and 0.87 on the same basis.

Oscilating volatility

So while asset class diversification is beneficial for improving returns in positive markets, in the downturn, exactly when investors are looking to diversification to provide some

protection, they are in fact even more exposed to equity risk.

The whole concept of diversification is subsequently getting a face-lift for the 'new normal' investment world, where markets oscillate between high and low volatility regimes. Risk rather than capital should determine allocation levels to different asset classes.

Weighting allocations between and within asset classes according to capital can be - misleading. Instead, allocations should be weighted based on the proportion of risk that comes from each portfolio asset.

A traditional balanced portfolio, for example, might have a capital allocation of 60% equities and 40% fixed income. From a risk allocation perspective, it is 90% equities and 10% in fixed income.

In contrast, a portfolio of broad market equity indices and broad market long-term sovereign bonds, has the highest Sharpe ratio on an efficient frontier with allocations of 50% equities and 50% fixed interest.

The corresponding capital allocations would be 28% equity, considerably lower than the - average UK institutional portfolio, and 72% fixed income.

Another approach to diversification is to focus on volatility, spreading risk by allocating assets to convergent and divergent asset classes.

The majority of investment strategies are convergent, based on the assumption prices will revert to intrinsic value.

This works well in stable markets, but is inherently short volatility. In contrast, divergent strategies, such as global macro or managed futures (CTA), are long volatility and therefore outperform in high volatility regimes.

Convergent strategies

"Most investors are overweight convergent strategies," according to Mike Arone, global head of product engineers at State Street Global Advisors, "and should be adding to their underweight divergent strategies. A portfolio that is diversified by investing in both divergent and convergent investment strategies is better positioned to protect portfolios from downside risk during periods of increased correlation."

Investors are keenly aware of the need to review diversification in the New Normal world. Equity allocations have fallen as the trends of de-risking and liability matching continue. In line with advice currently being offered by consultants and asset managers, institutions are further diversifying across a greater range of asset classes.

Since the end of 2007, flows into commodity, emerging market equity and debt funds have accelerated, almost doubling. Alternatives like private equity and real estate are enjoying renewed interest and new areas of economic value, such as art, timber and infrastructure are also gaining assets.

The growing popularity of implemented consulting certainly supports this trend as investors recognise the need for nimbleness and greater expertise across a broader range of investment opportunities.

Spreading risk

There is some concern, however, that while institutions are spreading capital more broadly, they may not be spreading their risk. Approaching diversification in terms of risk rather than capital requires considerable re-education and a fundamental shift in investors' mindset. "On aggregate, most investors are not really focussing on risk, which is troubling," said Peters.

"Even though diversification failed to protect portfolios in 2008, the solutions currently being implemented are only making changes at the margins and are not solving the problem. Fixing it means doing something different, but there has not been a paradigm shift."

Having invested in the technology required for allocating assets and assessing risk according to the old models of diversification, there is a tendency to revert rather than develop new systems and language. Selling new philosophies to investment boards is also difficult and entails a degree of personal risk for trustees.

As time passes and markets begin to recover, the urgency for change also evaporates.

Investors become less focussed on properly evaluating correlations, and therefore risk, in extreme downturns.

There is still a strong tendency to look at long-term correlation trends rather than downturns specifically. By diversifying further into areas like emerging market equities and debt, institutions may benefit from long-term growth potential, but may also be exposing themselves to greater downside risk.

This is particularly worrying if markets move sideways, which many experts believe will happen, potentially for as long as twenty years. The inevitable ups and downs means compound gains could be wiped out again.

As assets become even more globalised and increasingly placed in illiquid alternatives like infrastructure, the impact of each subsequent downturn on risky assets' correlations is likely to worsen. Even if the memory of this crisis has begun to fade, correlations have not returned to pre-crisis levels during the recovery. Correlations between March 2009 and the end of January 2011 are only marginally down, or even up in some cases. Further analysis by Global Asset Managers shows correlations of emerging market equities with the S&P500 have stayed up at 0.858 (0.865 during crisis). Latin American equities are more correlated with a recovery period correlation of 0.844 (0.811 during crisis, 0.722 pre-crisis).

But the fundamental case for asset class diversification remains open for debate. Some research suggests less diversification offered greater downside protection in 2008.

Asset management firm RCM compared a portfolio broadly in line with typical UK - institutional allocations with 50% global equities and 50% Euroland bonds, and a second, closer to typical German allocations, of 20% Euroland equities and 80% Euroland bonds. The first portfolio returned -19.35% versus -5.70% for the less diversified portfolio.

"At first glance, institutions in Continental Europe might seem less sophisticated," said Phil Dawes, RCM's head of consultant relations: "but the difference comes at the risk/return level."

In the UK, diversification is more often used to protect against downside risk, but that didn't happen in 2008. German investors are less diversified than their UK counterparts, but have a more sophisticated risk management approach with greater use of overlay strategies to give downside protection while maintaining portfolio integrity." So while UK institutions' continued diversification may seem well founded, it is not without potential dangers. With correlations still hovering near crisis levels and the prospect of a bumpy ride going forward, institutions cannot afford to ignore the growing risk from unstable correlations in an increasingly globalised investment world. Understanding how each asset class behaves in down markets and putting that in the centre of portfolio construction will be crucial for protecting the gains of the up years. That is, if you believe in diversification at all.

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