

Corrosive feedback

Innovations create their own feedback 'loops', and many of these are dangerous. Risk managers need to pay greater attention to such effects in the future, argues David Rowe

It is widely recognised that many innovations tend to encourage participants to search for ways to avoid associated restrictions. The most widely discussed example of this type of feedback is regulatory arbitrage – a phenomenon that offers the strongest argument for principles-based rather than rules-based regulations. Some corrosive feedback loops, however, have elicited little discussion and apparently limited recognition on the part of risk managers.

One such feedback loop relates to the use of value-at-risk as a nearly universal metric for setting limits on allowable market risk. I have argued elsewhere that, despite its limitations, value-at-risk was an important step forward relative to the complex web of micro-limits on:

- total open positions
- tenor mismatches, both individually and in total
- delta, (negative) gamma and vega limits on individual types of options.

In fact, VAR was the first reasonably effective basis for communication between the trading organisation and general management. It encapsulated an intuitive expression of risk that could be understood and subjectively weighed against management's gut sense of what was institutionally appropriate.

My SunGard colleague, Till Guldemann, is sometimes credited to be the 'father' of VAR¹. In a recent risk management roundtable, however, he emphasised a very important point. When VAR became the standard metric for measuring and monitoring the limits on market risk taken by traders, both individually and collectively, they had no choice but to comply. Traders who repeatedly and wilfully exceed their institutionally established limits will ultimately be fired. Nevertheless, traders still want to make their returns. It is hardly a big leap to realise one way of achieving this is to pile on risk in the tail of the loss distribution. The most common means of doing so is to sell significant volumes of out-of-the-money options that only generate significant losses when market variables make large moves. In many cases, the losses resulting from simulated market moves within a 1% probability envelope will be modest and well within VAR limits. If a major market move arises suddenly, however, the negative gamma of these positions can come into play before effective hedges can be implemented. The result can be unexpectedly large losses that are magnified by the negative convexity of the payoff profiles.

We have always known that VAR is not a full solution to the market risk measurement challenge. It is not, despite sloppy short-hand references, a worst-case loss. Rather, it is an estimate of the minimum twice-a-year loss that says nothing at all about how big losses might be when the VAR threshold is exceeded. The corrosive feedback effect is that the widespread use of VAR as a control metric encourages exactly the type of risk-taking that VAR fails to measure: namely, exposure to extreme events. Hence VAR doesn't just fail to address the most extreme losses – it actually encourages behaviour that increases their magnitude.

A second corrosive feedback loop was recently pointed out by Robert Merton and relates to the impact of traditional credit ratings applied to collateralised debt obligations (CDOs). Bond ratings have traditionally been a measure of the likelihood of default over the 12 months following a rating assignment or change. Fitch Ratings and Standard and Poor's have confirmed this also characterises their rating models for the various tranches of CDOs, including those based on subprime mortgage collateral. In effect, these models estimate the amount of subordination that is required to bring the probability of any failure in timely payment of principal and interest down to a target level. Merton points out, however, that once this degree of subordination is established there is a strong incentive to optimise within this framework. One way of doing this is to select collateral that increases the loss given default (LGD) (since LGD is not a variable used to derive the target level of subordination).

This can take two related forms. One is simply using cheaper, poorer-quality collateral with less restrictive underwriting standards, which obviously characterised the late stages of the subprime mortgage bubble. A second approach is more relevant to corporate CDOs. Generally, bonds that are more pro-cyclical tend to trade at lower prices than those less cyclically sensitive or even counter-cyclical, since the latter offer valuable diversification effects. When structuring bespoke CDOs, rating tranches based purely on likelihood of default encourages inclusion of the lowest-cost instruments, and these tend to be entities that are pro-cycle and offer the poorest recovery prospects in the case of default.

These two examples provide instructive warnings to risk managers that we need to think more creatively about corrosive feedback effects and incorporate such thinking into our future risk assessments. ■

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¹ Till was at JP Morgan when it developed its VAR system in the early 1990s and was instrumental in persuading the bank to make its data and methodology freely available on the internet, thereby hastening the adoption of VAR as a standard approach.

