

The false promise of expected shortfall

The Basel Committee on Banking Supervision has proposed using expected shortfall instead of value-at-risk as the central metric for regulatory market risk capital. **David Rowe** argues this will be both ineffective and dangerous

So much ink has been spilled over the strengths and weaknesses of value-at-risk that it seems pointless to restate them at length here. In brief, my view is that VAR was a major advance over the disjointed framework of non-commensurable limits that preceded its introduction. It addressed the issue of exposure to short-term market fluctuations in a consistent way. What it did not do, and never claimed to do, was say anything about what “lurks beyond the 1% threshold”¹, and the unfortunate fact is that too many executives outside the risk function failed to grasp its limitations. This led to insufficient emphasis on the much messier task of stress testing and scenario analysis (*Risk* January 2010, page 109, www.risk.net/1567662).

Not surprisingly, in the wake of the global financial crisis, the Basel Committee on Banking Supervision has sought to revise market risk regulations to take greater account of possible extreme events.² One element of its proposed revision is to use expected shortfall instead of VAR as the basic metric when setting market risk capital requirements. The committee argues that expected shortfall “accounts for tail risk in a more comprehensive manner”. It also points out some theoretical shortcomings of VAR, especially that it is not strictly sub-additive in all cases. This means portfolio measures of VAR are not necessarily smaller than the sum of VAR for two or more mutually exclusive and exhaustive partitions of the positions in the portfolio.³

Hypothetical conditions can be constructed in which VAR is sub-additive, but despite this theoretical possibility, my experience is that such circumstances rarely arise in practice. While one must be careful when using VAR in certain situations, I believe its theoretical shortcomings have few practical consequences. Furthermore, while expected shortfall accounts for tail risk in a more comprehensive manner than VAR, I believe its advantages in this regard are overstated and its severe shortcomings are being ignored by the committee.

Shifting from VAR to expected shortfall would be a genuine advance – but only if we actually had well-defined and reliable measures of the probabilities of tail events. The problem, of course, is that we do not. Lacking these, we try to fit theoretical distributions to the known observations and use these in our loss simulation process. The result is that expected shortfall will inevitably be a fairly stable multiple of VAR rather than a sensitive indicator of potential tail risk.

The limited advantage of expected shortfall might still make it a worthwhile replacement for VAR if it did not have two serious shortcomings. The first is that it is virtually impossible to back-test. Every one-day VAR estimate is a statement of the likelihood of an event the following day. As such it can be subjected to a simple and easily understood back-test by looking at the frequency of VAR excesses and asking whether they conform to the confidence level used to construct the metric. Estimates of expected shortfall, on the other hand, depend on the full shape of the tail of the loss distribution, which is fundamentally unknown – there are no *ex-post* realisations against which to test the accuracy of such estimates. Shifting from VAR to a measure whose empirical verification is virtually impossible would be a major step backwards.

The second shortcoming of a shift to expected shortfall is that it would reinforce the idea that we can deal with extreme event risk by tinkering with our distributional framework. This is a fundamentally dangerous idea. Purely distributional analysis will not provide the insights needed to avoid the next major crisis. Only a messy, qualitative, judgmental and somewhat unsatisfying process of grappling institutionally with potential crisis scenarios and their impact can set the stage for prompt action when low-probability, high-impact events take place. Anything that discourages this arduous process should be avoided at all cost. ■

¹ For a more complete exposition of my views, see *To VAR or Not to VAR*, available at <http://www.dmrra.com/publications/Other/To%20VaR%20or%20not%20to%20VaR%20-%20Insurance%20Risk%20&%20Capital.pdf>

² Basel Committee on Banking Supervision, *Fundamental review of the trading book, Consultative Document*, May 2012. Available at <http://www.bis.org/publ/bcb219.pdf>

³ Basel Committee on Banking Supervision, *Messages from the academic literature on risk measurement for the trading book, Working Paper 19*, January 31, 2011, pp. 17–20. Available at <http://www.bis.org/publ/bcb219.pdf>

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