The age of collateral

Even collateralised trading relationships can give rise to potential unsecured credit exposure. David Rowe argues that portfolio ageing is an important and often neglected source of such exposure

Collateral is an increasingly popular tool for reducing credit risk to trading counterparties. Some advocates on the business side of the fence argue that holding collateral eliminates such exposure completely. They would like to see collateral (or at least cash collateral) treated as a direct offset to total exposure. This clearly is too strong a position. There continue to be legal risks associated with holding collateral – you might not have perfected your interest properly or you might be on the receiving end of an unfortunate judicial opinion that puts a stay on your ability to liquidate the collateral. Given that there is some small residual risk of loss associated with collateralised exposure, it is important to set limits for it and to monitor against those limits.

That said, the question arises of how to fold such exposure into credit loss calculations. It is tempting to say that collateralised exposures are roughly comparable to triple-A quality obligations and apply a correspondingly low default rate. In fact, this is a second-best approach. Default is associated with a legal entity, not with specific exposures of that entity. (Of course, special-purpose legal constructs may allow some exposures of a corporate family to be segregated from others.) The more logical strategy is to posit a dramatically higher recovery rate relative to exposure at default for collateralised than for unsecured claims while applying the same likelihood of default for both.

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Unsecured exposure

Of more intense interest is the potential for unsecured exposure in the context of a generally collateralised relationship. Such unsecured exposure can arise from two basic sources. The first is an agreed unsecured exposure threshold, up to which amount collateral does not need to be posted. The second is the potential fluctuation in the value of the bilateral portfolio during the assumed close-out period.

The unsecured threshold is relatively easy to handle in the context of simulated exposure. Any simulated exposure up to the amount of the threshold is treated as an unsecured claim and subjected to recovery rates consistent with obligations of comparable seniority. It is the volatility of exposure during the assumed close-out period that creates the greatest difficulty.

Two sources of exposure volatility

There are two sources of potential volatility in the exposure to a counterparty over any given future period. The first is the potential change in portfolio value due to fluctuating market conditions. This is largely comparable to the standard problem of estimating value-at-risk for a given horizon. The second contributing factor is ageing of the portfolio. You may need to pay out on a large out-of-the-money deal during a close-out period. If so, this may have a much larger impact on the value of the portfolio than the potential impact of changing market conditions.

A brute force solution to this problem is easy to specify but hard to implement and support in practice. This would involve using Monte Carlo methods to simulate many daily path-dependent scenarios throughout the life of the portfolio. Say you are assuming a 10-day close-out period. You would then extract the simulated changes in portfolio value during every overlapping 10-day period. For every day you would extract the 95th or 99th percentile of the change in value over the preceding 10 days and treat this as potential unsecured exposure. (If the relationship gives you the right to hold excess collateral, you can reduce the unsecured exposure by an estimate of this excess at the beginning of each 10-day period.) This approach would capture the impact of both market sensitivity and run-off effects, but is far too complex and computer intensive to be deemed practical in most situations.

A more pragmatic approach

A common approach to this problem is to focus only on portfolio sensitivities using traditional VAR methods and to ignore run-off effects. This could, however, conceal a significant impact of structurally predictable changes in the portfolio. A pragmatic approach is to insert portfolio-specific simulation dates around the maturity of every transaction in a total exposure simulation. Then a reasonable approximation to the brute force result can be derived by combining separate analysis of the market volatility and run-off effects. In essence, estimate a 10-day static VAR based on market sensitivities at each simulation date. This gives the potential impact, at a chosen confidence level, of the volatility of market conditions. Then add the difference between the estimated total exposure on the simulation date and the exposure 10 days earlier, using interpolation if necessary. Having inserted simulation dates for all structurally significant events in the life of the portfolio, this approach captures both the run-off and market volatility effects without the excessive computational burden of the brute force approach.

Summary

Potential unsecured credit exposure remains an issue even in generally collateralised trading relationships. Estimates of the volatility of a counterparty's portfolio during future close-out periods should reflect both market sensitivity and ageing of the transactions. Examination of portfolio-specific run-off dates provides an attractive combination of reasonable computational requirements and effective capture of the impact of important run-off events. ■