From **VAR** to **stress testing**

Implementation of enterprise-wide VAR models in the 1990s was an important risk management advance, but it's time to rethink some fundamental aspects of how they were designed, argues ***David Rowe***

The authorised use of internal value-at-risk models for calculating regulatory capital was a major advance in bank supervision. It was accompanied by a drive towards best-practice risk methods as the supervisory benchmark. While we didn't fully realise it at the time, this effectively replaced sluggish advances in prescriptive regulation with far more dynamic competition over what constitutes best practice among banks.

At the same time, however, the Basel Committee's decision set off a major scramble to extend existing VAR models to incorporate consistent enterprise-wide coverage. There was also the need for more detailed documentation and a regular process for archiving and back-testing results. Banks had just over two and a half years to meet the initial date for regulatory use of such models, and few were willing to bear the stigma of failing to be among the first wave of approved institutions.

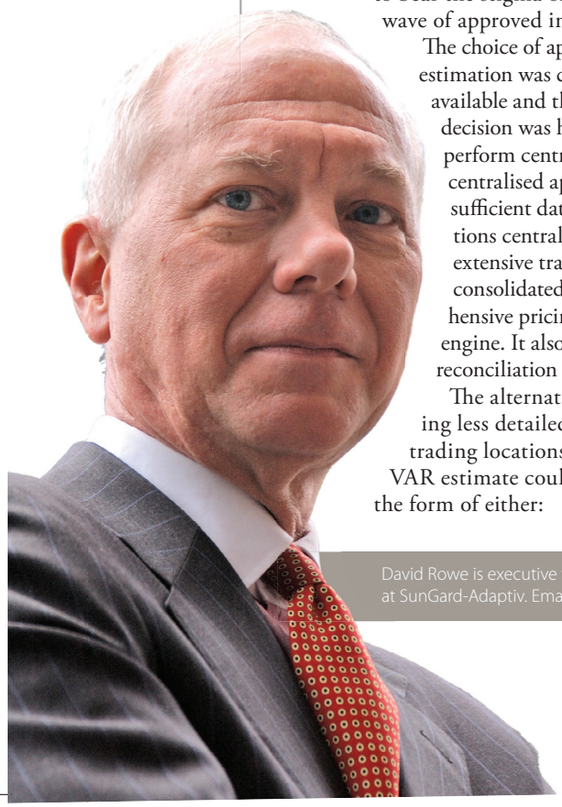
The choice of approaches for enterprise VAR estimation was coloured both by the time available and the technology of the day. A key decision was how much complex analysis to perform centrally rather than remotely. A centralised approach required the gathering of sufficient data to price and simulate transactions centrally. This was complicated by the extensive transaction details that had to be consolidated, as well as the need for comprehensive pricing tools in the central VAR engine. It also raised the need for regular reconciliation with local systems' valuations.

The alternative approach involved importing less detailed information from local trading locations, out of which a reasonable VAR estimate could be derived. This usually took the form of either:

- Greek sensitivities and consolidated cashflows, or
- a historical simulation results vector.

This leveraged local valuation engines and desk-level sensitivity calculations, but introduced an increased co-ordination burden.

Most banks opted for one of the decentralised approaches as the surest means of obtaining early supervisory approval of their VAR models and processes. Much of the infrastructure in place today still reflects these choices.



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New requirements

Contrary to what some critics said, it was recognised from the beginning that VAR, while an important step forward, offered only limited market risk insight. The widely recognised presence of fat tails in market variable movements meant some form of stress testing was necessary. Unfortunately, conducting such stress tests tends to be cumbersome and potentially unreliable in a decentralised VAR framework. Where simulation is performed by the local systems, distribution of all necessary scenario details can be fraught with problems. This is especially true when stress tests are done only occasionally so that a well-tuned operational process is never established. Furthermore, extreme market stress simulations based on simplified sensitivities may miss important behavioural aspects of the increasingly complex array of transactions and esoteric risk sources (such as collateralised debt obligation correlation).

New technology

While supervisory market risk requirements have only recently begun to change, technology has advanced rapidly ever since VAR models were first deployed. Decisions that were shaped by the computing costs and capacities of the mid-1990s need to be re-examined in light of the current and prospective alternatives. Object-orientated software, XML-based message protocols and grid computing are a few of the alternatives that were nascent or non-existent when current VAR processes were designed.

Clearly, the time is ripe for a reassessment of the VAR infrastructure at major trading institutions. A massive crash overhaul is neither necessary nor sensible. On the other hand, a well-planned programme to bring market risk systems up to date is advisable. Such a review should concentrate on:

- leveraging today's technology rather than conforming to decade-old constraints;
- improving the ability to analyse and diagnose potential sources of severe losses; and
- improving dynamic efficiency through the capacity for incremental enhancement of the system rather than massive periodic upgrades.

Both supervisory demands and available technology argue for rethinking the fundamental architecture of VAR systems. A deliberate programme now to make such revisions at an orderly pace is sure to be less costly than a crash programme later. ■