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Software Product of the Year

Algo Real-Time Credit Engine continues Algorithmics' commitment to innovation



SOFTWARE PRODUCT OF THE YEAR ALGO REAL-TIME CREDIT ENGINE, ALGORITHMICS

Algo Real-Time Credit Engine sets a new benchmark for the speed and accuracy of risk measurement in the front office.

It has long been the aim of financial institutions to have in place consistent risk measures across the front and middle office. This goal took on a critical urgency in 2008 amid rising counterparty credit risk concerns, as the financial crisis demonstrated just how quickly events can topple an institution.

Finding the required level of consistency, however, has been challenging. The ideal way to measure exposures is with Monte Carlo simulation, which takes time. While the middle office is able to work with overnight exposure calculations, this is too slow for the front office, which must check credit limits prior to trades being executed.

The usual solution in most institutions is for the front office to use mark-to-market-plus-add-on – a relatively crude measure that not only requires later reconciliation with middle-office figures, but ignores collateral and netting. Such an approach may also restrict business, because banks need to err on the side of caution when calculating limits in this way.

In 2003, Toronto-based Algorithmics gave its research team the task of seeing how fast they could get a Monte Carlo simulation process to run on affordable hardware. A supercomputer could have solved the problem but would have been out of the price range of trading desks.

Two years later, by optimising all the elements in the exposure calculation, from the movement of data on the microprocessors to the design of the simulator and the management of data for aggregation, the team came up with technology that could begin to meet front-office demands. French bank Société Générale was the first to experiment with it, using elements in a counterparty credit risk calculation system for over-the-counter derivatives. Although this improved the accuracy and speed of the bank's exposure calculations, it did not test the limits of the system.

Then, Bank of America (BoA) came up with an appropriate challenge. It wanted to introduce Monte Carlo simulation-based pre-deal limits checking for its electronic forex trading platform – the fastest, highest-volume market of all. In 2006, Algorithmics began work with BoA on integrating its new technology into the bank's trading environment. In April 2008, the system went live.



Neil Bartlett
Chief Technology Officer, Algorithmics

BoA's implementation, which it calls Integrated Credit Engine, enables pre-deal counterparty credit and settlement exposure calculations for its front-office forex trading desk and e-commerce platform – and the same methodology is used in the middle office. Each pre-deal limit check includes Monte Carlo simulation of 2,000 scenarios over 63 time steps, and deals are aggregated into the bank's 14,000 node counterparty hierarchy. The system also calculates the risk mitigation impact of close-out netting and collateral.

This process takes place in less than 20 milliseconds – the threshold under which an e-commerce platform must respond if a bank is not to lose deals to competitors. The system currently handles around 30,000 trades a day, although it has been built to cope with up to 200,000 and to operate continuously for the 24-hour global forex market.

With the successful BoA implementation proving the system works, Algorithmics has turned the technology into a product called Algo Real-Time Credit Engine – a cross-asset credit risk engine for trading desks and e-commerce platforms. BoA is planning to extend its implementation to other asset classes in the future.

“In today's e-commerce markets, if a bank can't do credit checks quickly it risks losing deals,” says Neil Bartlett, chief technology officer at Algorithmics. “At the same time, it is important for a bank to be managing risk in the same way at the point where it is taking the risk on board as it manages it in the middle office.”

More accurate exposure calculation in the front office that includes the impact of diversification, collateral and netting can lead to better use of credit lines, while consistent risk measurement across the front and middle office enables a bank to avoid time-consuming and costly reconciliation of limit excesses, adds Bartlett.

A system such as Algo Real-Time Credit Engine, with its sub-second counterparty credit exposure calculation capabilities, is very timely in an era where regulators have made it clear they expect banks to be able to calculate their exposure to a counterparty in a couple of hours. It also sets a new benchmark for the speed and accuracy of risk measurement in the front office.