

Fast and Furious: Risk Management in a DMA Environment

By Nina Mehta

In electronic trading, speed is of the essence. A second is now intolerably long for sophisticated traders who measure the time it takes to transmit an order in milliseconds. However, for clearing firms that must risk-manage the customers whose trades they clear and guarantee, that increased trading speed can pose a problem.

During the Futures Industry Association's OpTech conference in New York in June, a number of industry participants addressed the challenges of risk management in a world where speed is an increasingly urgent priority and direct market access is the new reality.

Stephane DiTullio, a director in e-commerce at Barclays Capital, began the discussion at one OpTech panel by distinguishing between two types of direct market access. In traditional DMA, clients route orders to a clearing firm's centralized order routing system, which sends the orders to the exchanges. In what DiTullio calls "pure DMA," which is becoming more prevalent among hedge funds, proprietary trading shops and other sophisticated clients, orders are sent directly to exchanges instead of going through a futures commission merchant's traditional infrastructure. Going directly to an exchange can reduce the latency, or time delay, in routing orders.

Pure DMA has become the domain of the "new pit trader," DiTullio explained. These electronic traders need to be the first to act on new information. For them, milliseconds are critical.

The irony is that while electronic trading fuels efficiency, reduces out-trades and generally offers traders more safeguards—courtesy of the clear audit trail it provides—the emphasis on speed can challenge traditional approaches to risk management. "This pure DMA includes a new level of risk," DiTullio said.

Setting Limits

Clearing firms traditionally assessed risk on a pre-trade basis—that is, as trades passed through the firm's order routing infrastructure and before they reached an exchange. This is still sufficient for the majority of customers in the futures industry. But for trading firms whose trading strategies depend on extremely high-speed access to exchanges, the delay caused by the pre-trade risk filter, even if it is only a few hundred milliseconds, is unacceptable. Practically, this means that risk assessment for the pure DMA clients has to be done after the trade is executed.

Clearing firms are cautious about taking on this kind of business. Several participants at the OpTech conference said their firms make a careful review of a trading firm's own risk management process and systems before agreeing to clear pure DMA business. But competitive pressures among the clearing firms make it hard to turn away these firms, and even the most solid risk management systems may not prevent a black box trading system from running amok. For example, a

quantitative trading system might contain a programming error that could cause it to fall into a loop, automatically resending the same order over and over to an exchange, hundreds of times a second. If no one intervenes, a huge amount of money could be lost very quickly.

This scenario is what worries industry experts such as Leslie Sutphen, a senior vice president at Calyon Financial. In a sub-second trading environment, the current state of post-trade risk management no longer cuts it, she told the OpTech audience. The cleared trade data from exchanges simply comes too late for an FCM to take action when customers are trading in milliseconds.

Sutphen stressed the need for both pre-trade risk management and post-trade risk management. She added that it is vital to find appropriate risk measures for sophisticated clients without compromising their strategies by slowing down their trading.

One problem with the clearing feed data is that it does not consistently come quickly enough. An additional issue is what data is

as what we get back to FCMs on a timely basis," he acknowledged during the OpTech conference. The exchange's electronic trading efforts have been geared toward "speed, speed, speed for Globex," he said. However, more money is now going toward the back end of the process—toward risk management and getting confirmations out to clearing firms more promptly.

Michaels noted that the exchange's clearinghouse conducts its own risk management. His group of eight analysts look for unexpected large losses at FCMs and search real-time data for unusual price, volume or activity spikes at the large-trader level, and rogue traders at the trader ID level. Some of this information, such as the trader ID level data, comes from the Globex Control Center, which has 40 analysts slicing and dicing data. The GCC is part of the CME's market operations and customer service group for electronic trading.

Besides getting cleared trade data back more quickly from exchanges, other things can be done to facilitate effective risk man-

an algorithm that's malfunctioning, a clearing firm may not be able to cut off the client's trading as quickly as necessary.

A number of ISVs offer products aimed at providing real-time risk management by scanning clearing feeds and generating alerts if customers exceed pre-determined risk limits. James Tomlin, director of risk systems at Patsystems, a vendor of trading and risk management technology, noted during OpTech that his firm's Risk Informer product provides a real-time consolidated view of risk data across asset classes. It relies on information from clearing feeds for real-time margin calculations based on SPAN, TMS or a clearing firm's own models. Any latency in that data makes margin and risk calculations less reliable, however.

Eric Wicart, a managing director at GL Trade, a trade order management system and post-trade derivatives platform, said his firm is building real-time, interactive risk tools for end-users and clearing firms. But customers, he said, are often reluctant to give clearing firms access to those tools, which include limits and throttles on the speed of trading.

The CME's Michaels noted that his exchange, which developed SPAN in 1988, is hoping to integrate pre-trade SPAN into the ISV world to improve the risk management process. In the future, he said, it might also be possible to wrap start-of-day positions into those calculations. At the moment, though, SPAN margin calculations often take half a second or more, so pre-trade SPAN is not fast enough for high-velocity trading. SPAN also has limitations, since the methodology isn't ideal for options and other complex products or spread strategies that are more difficult—and therefore more time-consuming—to risk-manage on the fly.

In a perfect world, Prudential's DiDomenico said, her firm would calculate its customers' risk on a real-time basis and get timely post-trade information from all exchanges. Prudential would have an internal risk management system that computes value-at-risk and runs Monte Carlo simulations intraday. In addition, all trades across markets and asset classes would be aggregated in a central location and the net risk exposure would be calculated on the spot.

Clearing firms customarily conduct rigorous end-of-day stress-tests on positions and run worst-case scenarios that take into account correlations between asset classes. These give a fuller and more accurate picture of a client's risk exposures, Sutphen said, but such computation-intensive calculations are not yet possible on a real-time basis.

When orders are transmitted through a clearing firm's system, the orders are tagged with information essential to the risk management process, but when the client is connected directly to the exchange, that information is not included.

contained in the clearing feed, according to Sutphen. When orders are transmitted through a clearing firm's system, the orders are tagged with information essential to the risk management process, but when the client is connected directly to the exchange, that information is not included. In addition, the clearing feeds at some exchanges do not provide information about working orders—orders that are resting in the order book but have not been executed.

The speed of post-trade cleared data varies among exchanges. The Chicago exchanges, Eurex and Euronext.liffe have a reputation for being fast—essentially real-time, said Sutphen. However, the Chicago Mercantile Exchange's cleared trades can take up to eight minutes if there's a logjam of trades, she noted. But even that beats Asian exchanges, which are typically slower.

Dale Michaels, a director in risk management at the CME clearinghouse, agreed that CME's data need to be more consistently real-time. "The information is only as good

as what we get back to FCMs on a timely basis," he acknowledged during the OpTech conference. The exchange's electronic trading efforts have been geared toward "speed, speed, speed for Globex," he said. However, more money is now going toward the back end of the process—toward risk management and getting confirmations out to clearing firms more promptly.

Michaels noted that the exchange's clearinghouse conducts its own risk management. His group of eight analysts look for unexpected large losses at FCMs and search real-time data for unusual price, volume or activity spikes at the large-trader level, and rogue traders at the trader ID level. Some of this information, such as the trader ID level data, comes from the Globex Control Center, which has 40 analysts slicing and dicing data. The GCC is part of the CME's market operations and customer service group for electronic trading.

Besides getting cleared trade data back more quickly from exchanges, other things can be done to facilitate effective risk man-

Sutphen added that another ongoing risk management concern in a world of direct access to exchanges involves unfilled customer orders. These orders must be risk-managed so an FCM can be comfortable with the trading activity and risk exposures of its customers.

Thomas Lenz, a member of Eurex's executive board, said that Eurex Clearing provides real-time position information to an FCM whenever a trade takes place. However, he stressed that a clearinghouse typically monitors only part of a customer's overall exposure, since the customer may be trading on multiple exchanges in multiple markets. For FCMs, that makes effective, real-time risk management a "multi-product dimensional issue," he said.

Lenz added that Eurex is contemplating setting "pre-execution position limits" on clients' trading for those connecting directly to the exchange, but he acknowledged that the additional latency involves a tradeoff between execution efficiency and risk mitigation.

From the Merc's perspective, Michaels said he would be glad to see every account at his exchange with pre-execution credit controls in place. It is currently up to each clearing firm to determine which accounts go through what credit controls. Ideally, he said, the pre-execution credit requirement would be for orders being facilitated as well as orders in the book, and there would be a universal algorithm—whether SPAN or something else—that could compute credit limits quickly enough to avoid delaying trades.

Euronext.liffe has taken a different approach to this issue. Paul MacGregor, director of technology partnerships at Euronext.liffe, said that when Liffe Connect, the electronic derivatives trading platform, was developed in 1999, "we came up with the concept of what we call the responsible person." That person at a member clearing or non-clearing firm is responsible for all the order flow that occurs under that person's individual trading mnemonic. Consequently, it's up to the exchange member firm to decide how many people use the mnemonic and how that trading occurs, MacGregor said.

More recently, Liffe Connect developed a "master trader mnemonic" that enables the member firm's so-called monitoring trader to log on and review in real time various sub-user mnemonics. If necessary, the monitoring trader can stop trading by those users. MacGregor said this functionality, which is currently being tested, would be included in the next version of the software that Euronext.liffe rolls out.

Many sophisticated and algorithmic clients balk at this oversight by clearing firms. However, in an industry that has "completely commoditized" execution, brokers need an accurate picture within a millisecond or two of what their clients are doing, insisted Barclays' DiTullio. "We need to take informed decisions about risk rather than cross our fingers," he said. After all, it is the clearing firm that remains legally liable for its customers' trading activity. ■

Nina Mehta is a free-lance reporter based in New York.