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Smart order routing takes DMA to a new level

Smart order routing is the key to success in the dark pool business. Its importance is likely to increase in tandem with growth in off-exchange trading and proliferation of proprietary dark pools.

SOR is an evolved form of DMA

Direct market access (DMA), which facilitated efficient electronic order flow by linking investors to securities exchanges via stockbrokers' networks, rapidly gained prevalence in the US from around 2000 amid growth in electronic trading markets. Brokers' role in DMA trading was to validate orders and route them to the exchange designated by the customer.

By providing access to more markets, DMA increased opportunities for order execution but it required investors themselves to identify the market currently quoting the best price. In response to this shortcoming, securities brokerages launched services that search for the best market on behalf of customers and automatically route orders accordingly. These services, which can be called an evolved form of DMA, were the genesis of smart order routing (SOR).

In the US, new regulations¹⁾ imposed in recent years require securities brokerages and exchanges to route all

orders to the electronic market quoting the best price. Such regulations have made SOR essential for brokerages.

SOR seeks out liquidity

Whereas US regulations define best execution solely in terms of price, European regulations incorporate more flexible standards (e.g., execution speed, execution rates). In Europe, various DMA offshoots have emerged. One example is Pathfinder, an SOR platform offered by Credit Suisse in the UK. Pathfinder is programmed to search for liquidity between CS's proprietary dark pool²⁾ and public markets.

Pathfinder retains customer orders within the in-house dark pool to await opportunities to be crossed with other customers' orders. At the same time, it also splits up orders into smaller orders and routes them to the London Stock Exchange and off-exchange markets such as Chi-X. If the order is then partially filled in the in-house dark pool,

Exhibit 1. Example of multi-posting SOR (UK Pathfinder) in action

| Time | Event | Market of execution (number of shares) | | | Explanation |
|----------|---------------|--|-------|-------|---|
| | | In-house dark pool | LSE | Chi-X | |
| 09:48:58 | New order | 10,000 | 3,500 | 6,500 | New 10,000-share order is submitted to in-house dark pool and simultaneously split into two orders that are routed to LSE and Chi-X. |
| 09:48:58 | Internal fill | 2,000 | | | Order is partially filled by 2,000-share cross in dark pool. LSE order is consequently reduced from 3,500 to 1,500 shares. |
| 09:48:58 | Order resized | 8,000 | 1,500 | 6,500 | |
| 09:49:00 | Chi-X fill | | | 1,423 | |
| 09:49:00 | Chi-X fill | | | 5,077 | Chi-X 6,500-share order is completely filled. Remaining 1,500-share order is reallocated between LSE (500 shares) and Chi-X (1,000 shares). |
| 09:49:00 | Order resized | 1,500 | 500 | 1,000 | |

Source: "MiFID Is Here," The Trade magazine, Jul-Sep 2007, Issue 13, revised by NRI

Pathfinder instantly resizes the orders submitted to the other markets. With Pathfinder, orders are typically entirely filled within seconds (Exhibit 1).

Types of SOR and implementation technologies

The SOR that first emerged in the US was sequential SOR, which routes orders to one market at a time while continually adjusting markets' priority based on current price quotes. Pathfinder, by contrast, splits orders into smaller units and simultaneously routes them to multiple markets. As such, it can be called a multi-posting SOR platform. Multi-posting SOR works well in regions with few exchanges and concentrated liquidity. It is well suited to capitalize on the UK's distinctive market attributes (Exhibit 2).

Multi-posting requires real-time data feeds from multiple markets. A multi-posting SOR system must internally reconstruct and constantly scan these markets' respective order books. It must route orders in response to price quotes and instantly resize orders to optimally allocate order quantity across markets. Also important are safeguards against combined order executions in excess of the original order quantity.

Technology-wise, algorithmic trading technologies that automate the trading process have notably been adapted

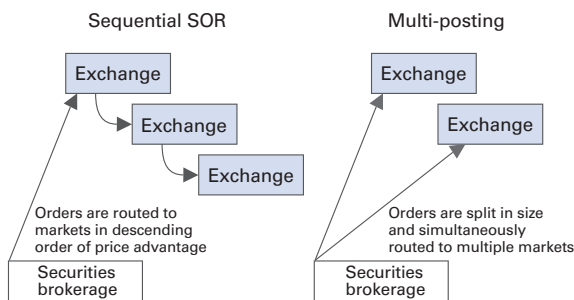
to DMA. Development of SOR systems with the requisite complexity and speed requires extremely highly specialized system technologies. Even major investment bank that have hitherto developed their own systems in-house have started to utilize external vendors with particular expertise in high-speed computing technologies.

Dark pools and SOR

From a trading business perspective, SOR is particularly important for securities brokerages that operate dark pools. In implementing SOR, brokerages must decide whether to place priority on routing customers' orders to external markets with deep liquidity or to an in-house dark pool with better prices and more anonymity. This issue warrants careful consideration in light of its strategic implications. It is no exaggeration that success in the dark pool business largely hinges upon how well SOR is implemented.

SOR is likely to increase in importance even in Japan as off-exchange trading grows and proprietary dark pools proliferate. Japan is similar to the UK in that the regulatory definition of best execution is flexible and liquidity is overly concentrated on one exchange (Tokyo Stock Exchange). These similarities suggest that multi-posting SOR is well-suited to Japan, but selecting an SOR technology requires due consideration of not only market characteristics but also customer needs and one's own business strategy. With algorithmic trading now showing signs of growth, DMA is poised to evolve in Japan.

Exhibit 2. Types of SOR



Source: NRI



Note

1) In the US, Regulation NMS imposed a best-execution obligation and prescribed rules regarding fair market access. It was phased into effect between October 2006 and October 2007.

2) Dark pools, also known as dark liquidity pools, are proprietary trading platforms whereby brokers cross customer orders in-house.

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