Price Sensitivity vs. Urgency in Liquidity Capture

New Statistical Models in Smart Routing Strike the Right Balance

Each time you are the aggressor with a stock -- trading at the inside or sweeping a few price levels in a range -- you make an implicit tradeoff of impact vs. opportunity cost. This tradeoff may result from a gut instinct or reliance on a default style of trading. With the market's unprecedented volatility, it is becoming more and more difficult to trust your instinct or rely on a certain style when you trade (Equity Research & Strategy "A Tale of Two Traders," April 2009). Often, a combination of price-level trading, pauses, and effective-range (liquidity) sweeps are needed for the best price result. Optimum Sweep from BLOOMBERG TRADEBOOK® introduces a *new* real-time, dynamic statistical implementation shortfall methodology that calculates the best blend of sweep styles and replenishment pauses so that you can seek the best possible execution result.

SOAR℠ with Different Sweep Styles

Bloomberg Tradebook's SOAR℠ (Smart Order Algorithmic Routing) aggregates fragmented markets and efficiently finds and extracts the market's displayed, hidden, and dark liquidity. You can choose a default sweep style or specify a price or liquidity sweep on a stock-by-stock or order-by-order basis. The sweep style you choose directs how the smart order router engages the market. In a price sweep, the smart order router maximizes price by sweeping the market price-level by price-level. In a liquidity sweep, the smart order router seeks greater liquidity capture by simultaneously sweeping several price levels at the same time – in an effective range. This gives you the opportunity to ask yourself: "Should I trade at the BBO (best bid/offer) to maximize price and seek price improvement, or should I trade an effective price spread and simultaneously sweep several price levels to maximize liquidity capture?" This capability has prompted many Bloomberg Tradebook users to change their sweep style to an order-by-order basis.

Tradebook's research group has quantified an approach to seek a least-cost way to take a specified number of shares with the new Optimum Sweep.

Learnings Lead to the Optimum Sweep

Since SOAR's introduction earlier this year, Bloomberg Tradebook has made several observations that have contributed to improved algorithm performance based on new logic. The result is greater efficiency in anticipation of where hidden and dark liquidity exist.

First, in Europe, we noticed a significant impact from efficient liquidity capture in the fragmented markets – in some cases, there has been up to a 30 basis point improvement in execution quality against primary exchange trading. Figure 1 displays Bloomberg Tradebook's actual liquidity capture during March and April 2009 across the liquidity venues, such as exchanges, multi-trading facilities (MTF), alternative trading systems (ATS), etc., in the FTSE 100, CAC 40 and DAX 30.

Secondly, we discovered that algorithms and market makers, both automated and human, influence the fragmented markets, as well as the single-exchange markets. In the past, a

Bloomberg Tradebook Trading Research & Strategy

Gary Stone, Director
+1 212 617 2297 | gstone2@bloomberg.net

Ron Taur, Head of Algorithmic Research & Trading
+1 212 617 1584 | rtaur3@bloomberg.net

Lisa Packham, Team Leader Europe
+44 20 7330 7967 | lisapackham@bloomberg.net

Greg Kelley, Team Leader Americas
+1 212 617 3395 | grkelley@bloomberg.net

Betty Kim, Team Leader Asia
+852 2977 6929 | bkim@bloomberg.net

Kate Confrey, Research Associate
+1 212 617 5688 | kconfrey@bloomberg.net

simultaneous sweep of a few price levels for liquidity was the best method of capturing liquidity. More recently, an opportunity for price improvement is achieved by sweeping a few price levels, pausing for replenishment (by humans and algorithms), then resuming the sweep.

Finally, we also learned that some venues are used as “penny jumping” vehicles (using non-standard tick increments in order to jump the queue with little size behind them).

Volatility Causes Indigestion
In the new environment of unprecedented volatility, fragmentation, and hidden orders, experienced traders are admitting that gut instinct is making them more and more uneasy. Liquidity is shifting, and stocks are trading very differently day-to-day, in fact, even intra-day.

At What Price Are You Willing to Pay for Liquidity?
To determine the optimum sweep approach, you first need to estimate the *true* amount of liquidity at each price level in the market depth. As discussed in the February 2009 Equity Research & Strategy “Putting Humpty Dumpty Back Together Again: The European Order Router Comes of Age,” assembling a European composite market depth feed is not a trivial matter.

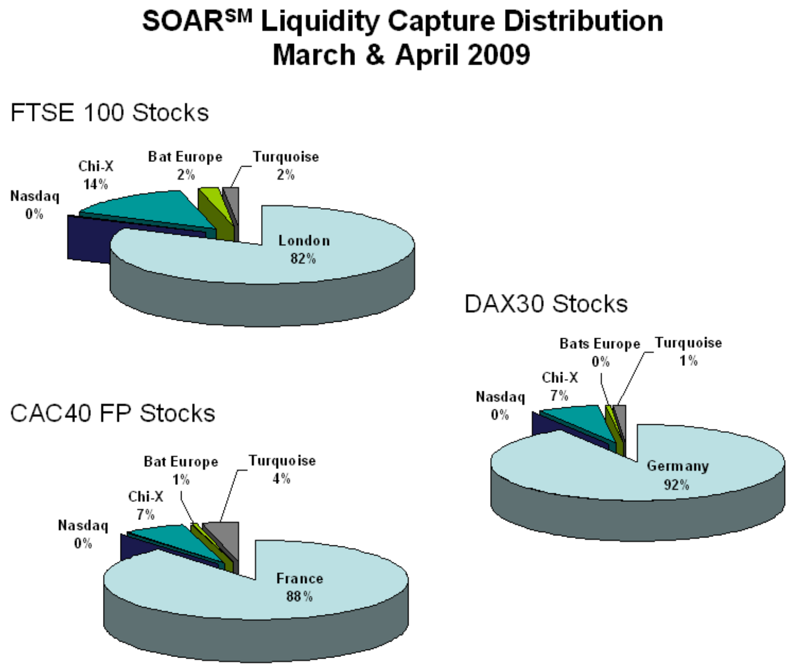

Figure 1

Constructing an accurate view of the liquidity in the market is a complex task. It is necessary to manage time skews, identify and filter out potentially bad quotes, and process different data feeds. In addition, the information must be presented in real-time to the trader and the sweeping algorithm.

Bloomberg Tradebook utilizes a "ticker plant" to process all of the data feeds so that our smart order routing algorithms have an accurate milli-second view/state of the "world". Many other brokers might cut corners by only looking at best bid/offer, which makes proper sweeping at a technological level impossible.

After trying to establish the proper market, now you must estimate what is hidden and anticipate how the market will react and replenish liquidity in response to a sweep.

Tradebook keeps a historical and real-time intraday database of a stock’s trading behavior. Data is drawn from our "virtual consolidated tape", as well as learnings from sweeps occurring from our benchmark algorithmic trading strategies, tactical trading algorithms, and DMA sweep behavior. Tradebook tracks the actual success rate of liquidity extraction from ICEBERGs and calculates a probability of an ICEBERG refilling.

The New Optimum Sweep
Determining the optimum sweep approach depends upon a combination of factors including: (1) the type of stock; (2) the size of the order; (3) the velocity of trading; (4) the average trade size; (5) the display size; (6)

An optimal approach to sweeping 50,000 shares may be to sweep 2 cents, pause to let the market replenish, then continue the sweep.

the hidden liquidity in ICEBERGs or “dark pools” and (7) the extent that liquidity is fragmented across several venues.

The total cost of a sweep impact is the depth you sweep, plus the opportunity cost that may be introduced by pausing to let the market replenish in an attempt to get some price improvement. Tradebook's new Optimum Sweep algorithm uses a combination of extensive market data and real-time execution information to employ an implementation shortfall methodology that balances a combination of liquidity-based sweeps, price-based sweeps, and appropriate intra-sweep pauses to let the market replenish in order to seek the best overall execution average price (Figure 2). For example, an optimal approach to sweeping 50,000 shares may be to sweep 2 cents, pause to let the market replenish, then continue the sweep. Tradebook’s research group has quantified an approach to seek a least-cost way to take a specified number of shares. We expect most traders will adopt Optimum Sweep as their default sweep style and adjust to liquidity or price sweep on an order-by-order basis.

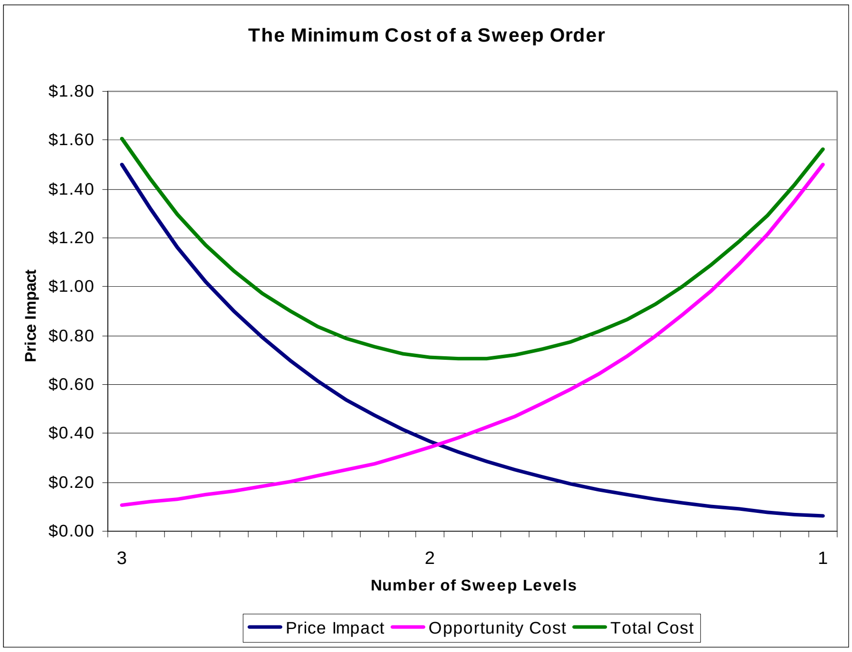

Figure 2

Figure 3

Figure 4

Defaulting to Optimum Sweep

The Global Tradebook User Profile function (**GTUP <GO>**) enables you to set your default to Optimum Sweep (Figure 3). You can change the sweep style on an order-by-order basis by changing thesweep style on the ticket window (Figure 4).

Optimum Sweep in Single Exchange Markets

Optimum Sweep is not only helpful in fragmented markets like Europe, Canada, and Japan, but also in single exchange markets - where stock liquidity is dominated on a primary exchange (e.g., Asia).

It is a common misconception that order routing is the same for all stocks that trade on a single exchange just because the central limit order book (CLOB) is the common execution gateway. Data from third party transaction cost analytic providers, such as Elkins/McSherry, challenges the notion that execution in these markets is a commodity – there are significant differences in execution performance. Brokers handle orders differently. Many use simple market or limit orders rather than leveraging the exchange's native order types.

Asia's markets trade in a deliberate fashion. As noted in Tradebook's March 2009 Market Structure Focus "SOARing through Asia," there is a heavy human influence in the making of markets; algorithms stay upstairs waiting to respond to events and the exchanges tend to batch order placement and order executions. Depending upon how your broker sweeps the market, your order can rip through several price levels before participants can respond. For buyers, prices spike only to fall back to earth after the order is complete. Truly smart order routers, such as SOAR℠, recognize that the electronic world has to slow down in these markets; otherwise, opportunities, liquidity, and better prices are missed.

Optimum Sweep uses historical and real-time statistics in these markets to optimize the sweep and wait times. For example, Optimum Sweep takes liquidity, lets the exchange batch the executions, and gives the market the opportunity to catch-up before starting to engage the next price level.

Combining Superior Liquidity Aggregation & Optimum Sweep

Tradebook's SOAR℠ efficiently puts the fragmented liquidity landscapes of Europe, Japan, Canada, etc., back together. Our platform provides a total solution to seek better executions as a trader – whether you are trading a stock that has liquidity spread across several venues or residing on only one venue. Optimum Sweep can now help you optimize your sweep style, balancing the tradeoff between impact and opportunity when either you or your tactical trading algorithm or algorithmic trading strategy are the aggressor with a stock.

Talk to us when you are ready to SOAR…..

Bloomberg TRADEBOOK

US +212 617 7070

EUROPE +44 207 330 7099

ASIA +65 6212 9798