

TRADING STRATEGY: ALGORITHMS FOR STRESSFUL SITUATIONS

In volatile times, traders ratchet up the urgency. Being buyer (seller) in a momentum-driven market is stressful. The last thing a trader needs is for the portfolio manager to see his order filled a half-point higher. During the highly volatile periods in 2010/11, when the CBOE SPX Volatility Index (**VIX Index <Go>**) rose above 25, the use of Market orders rose by 175% as a way to “get it done, here, now!”

Tradebook’s Market Order Algorithm

In the past, when the NASDAQ and the NYSE had commanding market shares, market orders generally were exchange order types. The U.S. equity market is now fragmented with no venue commanding more than a 20% market share, thus a market order needs to be an aggressive liquidity-aggregating and liquidity-seeking algorithm. The Tradebook market order algorithm is an extremely aggressive algorithm that sets a limit—the “contra side” price plus 10%. The synthetic limit is a safeguard that seeks to prevent the algorithm from buying or selling a stock at extreme price levels. We built our market algorithm in this manner for two reasons: (1) markets do have liquidity gaps and (2) because, philosophically, we found it hard to believe that a trader or portfolio manager would ever say (in the case of a buy order) “I would pay any price for this stock.” At some price level, the stock stops having value. Our aggressive synthetic limit methodology came in handy on May 6, 2010, when our sell market orders paused as the market flushed and started to buy on the way back up.

The market order algorithm aggressively engages the lit, gray and dark pools—firing out at the

different displayed venues and probing to find and extract liquidity in undisplayed venues. For the displayed venues, statistical engines operate in the background to estimate how much Reserve is probably behind the displayed order. Opportunity cost is what makes this optimization critical. It happens rarely — if you fire too little, you don’t get everything you can; if you fire too much, the shares are somewhere and not available to be recycled and fired at venues that might have liquidity. So, Tradebook oversize-fires at what we believe to be optimal; if we get completely filled, then more Reserve is available to capture. Using historical and real-time analysis, the **Reserve-HunterSM algorithm** dynamically determines the optimal-oversize amount that could extract the rest of the liquidity.

While the lit venues are engaged, the **Liquidity-HunterSM algorithm** probes the gray and dark venues to find and extract the market’s hidden liquidity that could be held in discretion, in outright hidden orders or in dark pools. These intricate oversize-fire, Reserve-Hunting, Liquidity-Hunting, etc., continue until the order is complete or the aggressive limit is reached. The market order algorithm does not post — it only aggressively seeks liquidity.

It is important to note how Tradebook’s smart order router prioritizes venues. The order router selects the venues based on a matrix of factors, including speed, anticipated size and price. The router is fine-tuned so that the first wave of orders attempts to hit all the venues at the same time in order to limit liquidity fading from latency arbitrage. The subsequent oversizing and refires are sent in the order that the venues respond.

w/SubOrds>	Side	TotalQty	Limit	RsrvQty	Display	Peg	Discretion	Bang	FillQty	AvgPx
1) CXL Bsm B	B	10000	17.19	0	AUTO	AUTO	AUTO	NORM	0	

Figure 1: Tradebook BMQ<GO> actionable mini blotter

Want More Control?

Market orders are like sledding down a mountain on an inner tube. Once you push off, you have little control over your direction, you endure bumps during the ride and the only way to stop is either by getting to the bottom or jumping off of the tube somewhere on the trip down.

Large orders are difficult to manage with a Market instruction. For these orders and for traders who just want more control, we suggest using the Tradebook’s **B-SmartSM algorithm**. Fast-moving and volatile markets are opportunities for seeking price improvement. B-SmartSM provides traders with more control over their urgency during the trade. B-SmartSM can be aggressive like a market order or can, in one click, be eased off and slowed down. B-SmartSM has four urgency settings: React, Passive, Normal and Aggressive. In volatile periods, Normal and Aggressive will typically be the urgency settings employed.

You can see it on the tape—during volatile times, bids get hit at the same time as offers get lifted. Buyers are afraid that the market is going to pop higher at the same time that sellers are afraid that the demand is going to dry up. Everyone is stressed. The **AGGRESSIVE** urgency seeks to capture the most liquidity by concentrating on sweeping the market; the added dimension to B-SmartSM **AGGRESSIVE** vis-à-vis a market order is that B-SmartSM posts orders in the statistically most active venue, thus improving the best Bid/Ask. In this way, it seeks to pick up the market’s natural price improvement.

B-SmartSM also offers greater control. If you start to sense the contra side getting more aggressive, you

can ratchet down the urgency to **NORMAL** in one click of the “-” red box (Figure 1). **NORMAL** randomizes between Passive and Aggressive behavior; when Passive, your order will post “smartly” to gain the spread, when in Aggressive, the algorithm nibbles at the market—always leaving something on the displayed side of the market in order to control impact by not taking out a price level.

Be Prepared — Customize Your Workflow

Volatility strikes unexpectedly. You can create custom settings for your algos and store them as “hot” buttons on you BMQ<GO> trading monitor. For example, you can create a “HAMMER” order that is saved as a B-Smart **AGGRESSIVE** with a limit of 10% above the current ask price. Clicking on the “My Algos” toolbar launches the customization screen (Figure 2). Tradebook’s Execution Consultants can discuss with you how to customize the algorithms to help you achieve your execution goals.

My ALGOs+	Total	Mmkr	Size	Bid
HAMMER	212	ARCX	212	15.67
	304	EDGX	92	15.67
	372	CINN	68	15.67
	439	BATS	67	15.67
	474	NQPX	35	15.67

OTC LISTED Tradebook Customized Trading Algorithms and Strategies

Side ? Total 1000 Limit Order Type LIMIT Direct To Sweep Style PRICE

OrdHandling Display Strike To Pegging DscrType Order State ACTIVE

Account SMART TOTAL Strike Incr Pegging Incr Dscr Incr Start Time

Decrease Strat Peg Freq(sec) Trigger Qty TIF (Min.Sec) DAY

Strategies >> Clear Save

1) HAMMER BUY 10,000 @ BSMART /SMART Ask+10%

Figure 2: Tradebook My Algos view and saved strategies screen.

Please contact Michael Baradas at mbaradas1@bloomberg.net or Gary Stone at gstone2@bloomberg.net with any questions.

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