

A new paradigm for achieving best execution in a fragmented equity market

Equity markets in the United States have undergone a dramatic transformation over the last decade as a result of changes in technology and regulation. These changes have ushered in a period of dramatic growth in electronic trading. As electronic trading has come to dominate the markets, a number of other characteristics have emerged, among these a dramatic reduction in trade sizes in the displayed-order books and the emergence of electronic solutions to the information leakage problem in block trading. We expect that recent experience in the US will serve as a prologue to the ongoing evolution of the European markets as MiFID-inspired changes take hold.

To buy-side traders, these developments have made life more complicated. Sourcing liquidity requires an awareness of the trading dynamics associated with more than 40 different execution venues, creating

Henri Waelbroek, Ph.D., director of research, Pipeline Trading Systems, makes the case for using its Algorithm Switching Engine for managing algorithmic executions as it prepares its products for release in Europe



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opportunities to hide an order but also throwing up new challenges in finding optimal ways to protect proprietary, order-related information.

To address fragmentation, the investment community has adopted a variety of strategies, one of which is the widespread adoption of algorithmic trading. Algorithms are now available from a wide variety of vendors and differ significantly in terms of their consistency and quality. Furthermore, the performance of each algorithm depends on market conditions. While the market price is largely unpredictable, the same is not true of order flow imbalances or liquidity flows. As a result, a large part of

the variations in algorithm performance turns out to be predictable, based on an in-depth analysis of real-time market data.

Algorithm Switching Engine
Pipeline Trading Systems, through its partnership with Adaptive Technologies, Inc., (ATi) has developed the Algorithm Switching Engine – a new paradigm for managing algorithmic trades. ATi has over 12 years of research devoted to developing quantitative models to predict performance in dynamic environments. The Engine employs many of the same data mining techniques that are incorporated into the trading strategies of quantitative and statistical arbitrage hedge funds. By observing how the market responds to reported trades – whether ini-

Algorithm Switching Engine™

tiated by the observer or not – inferences can be made about the nature of algorithmic strategies currently active in a particular stock and turned into a co-adaptation strategy leading to significantly reduced market impact.

All algorithms possess a strategic identity that can be associated with a particular axis of order flow. They also create a specific footprint in the market data stream that can be detected through the use of data mining techniques. Over time, continuing to execute an order through any single algorithm will reveal statistically valuable information about an order. As the expectations of future order flow are incorporated into the market, they are a source of adverse market impact that will result in increasing the completion price of the order.

It follows that cost savings can be realised by minimising the footprint and avoiding the growth of price-altering expectations that result when any one axis of order flow is exercised for an extended period of time. The solution is to manage the information that is delivered to the market by switching algorithm strategies.

Is market impact inevitable?

Pipeline's Algorithm Switching Engine represents a breakthrough in algorithm management. Using ATi technology to predict algorithm performance based on meta-variables that capture market data and the market response to its orders, the Engine goes far beyond the capabilities of smart order routers, extending the concept of best execution from the level of a single transaction to the level of large trades that survive several transitions in the short-term market conditions. The predictive model uses advanced data mining techniques to continually predict algorithm performance and engage the optimal algorithmic strategy given the current market conditions – all with an eye to driving an order to completion within a timeframe controlled by the trader. The Engine is constantly evaluating in excess of 50 data streams to make decisions about algorithm selection. When it comes to selection of algorithms, it has over 100 choices to select from and then utilises those to access over 40 execution venues.

While traders generally understand that algorithm performance varies with market conditions, how

much potential is there to increase alpha capture for a giant trade? Is impact mostly an inevitable consequence of the additional supply or demand for a security, or is a significant part of this impact caused by adaptive expectations as traders observe the footprint of a large trade and modify their views about the fair price of a stock accordingly? To answer this question, Pipeline has performed extensive trading experiments, trading market-neutral, sector-specific baskets of stocks, alternatively employing the Switching Engine technology or using single algorithm strategies. These experiments demonstrate a reduction in trading costs of 30% from predictive switching relative to single algorithms – market impact is anything but inevitable!

Using the Engine automates the control over the algorithm settings that require real-time management and attention, freeing the trader to control factors that are specific to implementing portfolio manager instructions, execution speeds and strategic price limits. ■

