# Dealing with data

Buy-side traders used to have limited interest in the workings of an algorithm. Now, is there such a thing as too much information?

Chris Hall

The common, somewhat dismissive, line on algorithmic trading is that it's a commodity. Push your smaller trades down the pipe to allow your traders to concentrate on the trickier stuff. Month-end transaction cost analysis (TCA) will tell you that all algorithms perform to within one standard deviation of their advertised benchmark so it doesn't much matter which one you choose.

Up close the picture is different, of course. Granular, real-time TCA is revealing the impact of executed orders on follow-on fills and opening up new opportunities to improve performance and drive down execution costs. More immediate, more detailed transaction data lets the trader keep a close eye on the simpler trades he has diverted down an algo, ready to intervene when alerted, while he simultaneously makes more effective use of all available liquidity sources for more challenging orders.

### Below the surface

Aside from technological advances, a number of market factors are driving the buy-side desk's data mining revolution. First, continued economic uncertainty since the financial crisis has significantly reduced alpha generation by active managers, resulting in increased pressure on traders to minimise slippage or even create a little alpha of their own. Second, poor returns from institutional money managers have led their clients to scrutinise operating costs and processes more carefully, a trend intensified by a spate of shocks that have shaken investor confidence in financial market structure. Third, the slump in portfolio turnover rates in 2012 that was an inevitable consequence of the first two points has given trading desks both the

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time and the motivation to streamline their execution workflows. Although many buy-side heads of trading are having to do more with less, this isn't purely a euphemism for cutting head count: traders are deepening their understanding of electronic tools and digging into the entrails of executed trades to build a sustainable framework for low-cost, low-impact trading. Last, and by no means least, the shrinking of commission wallets adds urgency to brokers' efforts to explain to users how to get the most out of their algos. Hence the rise of execution consulting services to build and adapt algorithms in response to customer needs and the availability of even more detailed and timely analytics.

"Buy-side traders are being asked to add alpha," says Bob Moitoso, senior vice president, SS&C Financial Markets Group, a supplier of front-office workflow and connectivity solutions to buy- and sell-side firms. "They're working a lot harder to understand how they can use the information to show value."

Intensified use of data and analytics to take control of trades is also recognised by John Comerford,

> **"Clients want more visibility into the black box."**
>
> *John Comerford, global head of execution trading research, Instinet*



**FIGURE 1: INSTINET INDIGO REAL-TIME TRANSACTION ANALYSIS TOOL**

*Source: Instinet*
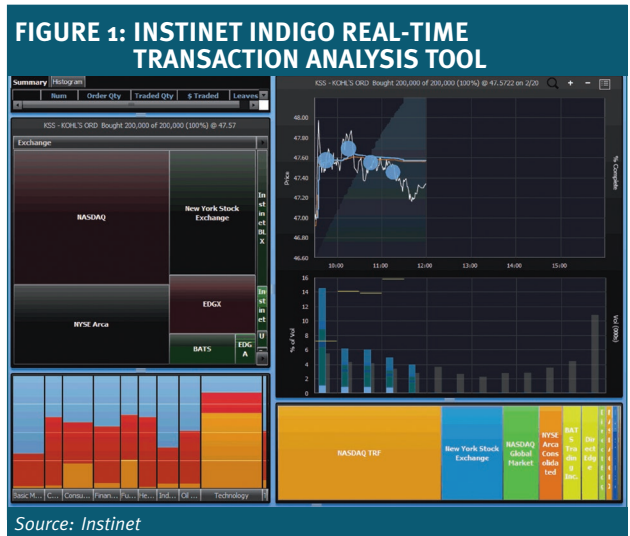
agency broker Instinet's global head of execution trading research. "As the market has moved almost entirely to computerised trading, clients want more visibility into the black box. They don't necessarily need to know every little thing that goes on in the algo, but they want to know how it is operating and whether it's making the right decisions," he says. "The more a user can be assured that the decisions the algo is making are the same ones they would if they were fast enough, the safer he feels."

So what kind of data do buy-side trading desks want and what are they doing with it? Among the priorities are: pre-trade inputs that influence trade timing and algo selection; real-time feedback to alert traders to unforeseen market developments; post-trade execution performance data aimed at refining and customising algos; comparisons of execution quality across venues; and routing-logic data that helps establish pre-execution 'footprint'.

Overall, the trend is for an increase in transparency and control of execution to the buy-side firms with the resources to make use of it, with brokers' willingness and ability to lift the lid on the quality of their execution services being pushed to new levels.

**Hard evidence**
With any trade, timing is crucial, but this is rarely

entirely in the gift of the trader. Much will depend on the investment style of the portfolio manager, who may expect a trader to act as soon as an order is issued, regardless of market conditions. "Most traders know in their bones if it's better to trade a particular stock in the afternoon, but might relent to pressure to trade some of the order in the morning," says Simon Maugham, head of research at Olivetree Financial Group, a UK-based broker and technology provider. "We provide them with the hard evidence of when market impact will be at its lowest."

Olivetree's research team uses its OTAS analytics platform to highlight market trends that might affect clients' trading strategy, for example, using metrics such as earning-per-share momentum, short interest, option volatility

> ■ "Two different brokers might call the same ATS by two different codes."
>
> *Bob Moitoso, senior vice president, SS&C Financial Markets Group*

and director dealings to anticipate share price reaction to earnings releases. In addition, clients can use OTAS' Trade Shaper functionality to predict market impact risk. Based on a stock's previous 30 days' trading, Trade Shaper generates expected volume, volatility and spread levels to help traders identify the optimum time and strategy for a trade. New functionality being added to OTAS includes analytics that track price against spread and volume to identify trends in liquidity, which can isolate changes to market-making activity and deliver reduced cost and market impact.

Tools like OTAS provide valuable input into the trading decision without risking information leakage to the sell-side, a perennial concern of the buy-side trader. According to Vikas Kedia, managing director in trading platform provider Flextrade's London office, some buy-side trading desks are wary of some brokers' pre-trade cost analysis tools and as such do not share precise data on their planned trades. "But it is increasingly common for traders to send a request for expected trading cost to a

range of brokers to identify consensus," he says.

Moreover, post-trade is the new pre-trade, says Kedia, claiming asset managers are constructing reports that highlight outliers in execution performance or identify reasons for slippage in previous trades. "It's much easier these days to ensure you are comparing apples with apples. By categorising previous trades in terms of % of ADV, volatility, sector, country etc., the buy-side trader can compare how two brokers have performed when executing similarly tricky stocks," says Kedia, adding that initiatives such as OpenTCA have also improved transparency. Launched in Q4 2011, by trading technology provider TradingScreen in association with four brokers – Bank of America Merrill Lynch, Citi, Nomura and UBS – OpenTCA proposes universal standards for the delivery of TCA.

SS&C's Moitoso suggests the ability to compare broker-specific post-trade data to better inform tomorrow's trades is well within reach. "As part of our FIX infrastructure services, we normalise messages and data, for instance helping a

buy-side firm using FIX 4.0 to connect to brokers using 4.2. Because we've normalised that data, different brokers' execution reports potentially using multiple versions of FIX arrive at the buy-side in formats they can take into their OMS or in any format they're using downstream," he says.
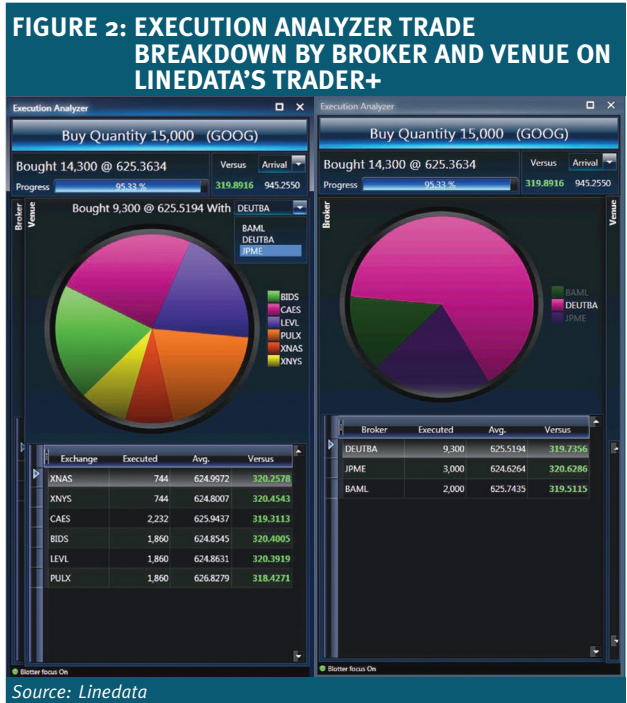
## Market colour

Instinet has recently upgraded its real-time transaction analysis product, newly branded Indigo, with new data visualisation techniques. Instinet's Comerford argues that data visualisation – essentially, the effective communication of information through graphical means – is potentially a rich seam of insight for buy-side trading desks.

"The trick with visualisation is to aggregate the data and present it in an intuitive manner," says Comerford. "The ideal is to blend traditional forms of data, such as stock charts, with new paradigms of visualisation. This might be relatively straightforward, such as a heat-map, but it could be a new kind of display that distils familiar data in a way that is more easily interpretable by the eye, which is what we've

■ "Buy-side traders are looking for the trail left behind by a trade as it goes from venue to venue in search of fills."

*David Hagen, director of strategic accounts, Linedata*

**FIGURE 2: EXECUTION ANALYZER TRADE BREAKDOWN BY BROKER AND VENUE ON LINEDATA'S TRADER+**



Source: Linedata

done with our new Indigo real-time analytics product."

As part of its development of analytics tools for clients, Instinet has done some work on how the brain processes colours and how the brain groups colours together. If the colours are too far apart on the visible spectrum, the brain puts them in different groups, which can affect how it interprets data. "So instead of using different colours, you might choose differently textured representations of the same colour, so that the brain can separate

the information into subgroups, but knows that it is part of the same overall group," explains Comerford. "This is still in a relatively nascent stage, but nevertheless it's very interesting to present data based on how the brain processes information visually. The aim is for traders to understand the data intuitively. If you do it right, you spend less time on training, because it makes sense to the traders immediately."

In Figure 1, the top left panel shows a heat-map of fills by venue, below which

is a visual representation of the trader's blotter (blue = buys, red = sells, orange = shorts). The top right panel shows the size and price against VWAP of four actual fills, with further details highlighted by cursor. The middle right chart shows percent of volume for individual fills while the volume map at right bottom provides a profile of previous day fills.

According to Comerford, one of the most useful applications of data visualisation currently being used by buy-side traders is the ability to overlay one's own trading activity on top of a normal stock chart. Today's analytics tools can show the client where and when they are trading versus their overall strategy, and can also help them understand the underlying trade velocity. "It's not necessarily a massive jump, but if you can present trade velocity in a way that the trader can digest easily, he can quickly grasp whether he is trading slightly too fast or too slow versus an implementation shortfall benchmark," says Comerford. "And if a trader is measured against VWAP it's really easy to give visual clues as to whether and why he is doing better or worse than VWAP.

You can look at how the underlying algo is predicting volume versus how the market is actually trading."

### Quick consultation

Demand for a real-time view of algo performance is a direct consequence of the collaborative efforts of brokers and their clients to tweak off-the-shelf execution algorithms to meet specific needs and circumstances. Indeed, the work of execution consulting teams has become integral to the battle for electronic trading market share.

At J.P. Morgan, which has invested significant resources in its electronic business for the past four years, constant evaluation of client trade performance enables the firm's Electronic Client Solutions (ECS) team to make trade-specific suggestions. "Although schedule-based strategies are still popular, many clients are using liquidity capture algorithms more regularly," notes Frank Troise, the firm's New York-based global head of ECS.

Like the analysis, the customisation process is accelerating. Last April, UBS launched 'UBS Quant on Demand Studio' an iPad-based app that enables the firm's execution consultants

and clients to design algorithms for rapid deployment. Whereas algo customisation requests used to take weeks or even months, UBS says that client-specific inputs such as 'what if' scenarios, benchmarks and work flow preferences can be fed into a tailor-made, ready-to-trade algorithmic strategy within 24 hours. Now rolled out globally, the development tool is intended to be part of a suite of products and solutions offered by its 'client-centric' Quant on Demand execution consulting team.

The availability of such tools and the need to scrutinise trades have added depth to client interaction in the past 12 months. Charles Susi, global co-head of Direct Execution at UBS, says feedback to clients takes two broad forms: short-term and real-time analysis of individual executions; and longer-term aggregated reports.

"With lower volumes last year, clients were very focused on minimising impact. They're asking our views about venue analysis and methods we employ to adapt liquidity sourcing to the new market environment," he says. "Questions from the buy-side are getting a lot more specific.

That deepening of knowledge may in part be a reflection of a greater awareness of market structure issues among end-clients and at board level. On the other hand, few buy-side firms have the resources to trawl through 300-page regulations, so they tend to rely on their brokers to flag issues with new rules."

### Show me the way

A growing focus of transaction analysis for many buy-side firms has been execution quality in dark pools. As J.P. Morgan's Troise observes, "The key to interacting with liquidity in dark pools is to understand the flow in each particular pool and how to best interact with it." By their very nature, it is harder to identify the type of flow you are trading against in a dark pool and comparable tick data is not necessarily easy to come by. This lack of transparency is offset by the appealing prospect of finding institutional-sized natural flow.

Barclays' work with clients on venue analysis is an example of the buy-side leveraging broker resources to achieve results that they would struggle to achieve themselves. Last year, Barclays hired two

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execution consultants to help clients interpret TCA data and provide research, the first example of which is a strategic analysis across US dark pools that attempts to establish a neutral framework for comparison of off-exchange executions. The consultants analysed short-term alpha and post-fill market volume data on an aggregated basis to identify differences between venues and came up with two main conclusions. First, the differences in execution between venues are sufficient for buy-side trading desks to prioritise a detailed

understanding of both the routing strategies deployed by their brokers and a constant monitoring of fills across venues. Second, that this level of vigilance can best be achieved by requiring brokers to supply standardised data files based on information contained in FIX messages.

As Barclays notes, intrinsically aligned to venue analysis is scrutiny of routing logic. Brokers were inundated with requests for information on how they routed orders to venues following block-trading platform Pipeline's fine for crossing trades against a prop trading unit in Q4 2011, but a need for greater clarity persists, not least because of a nagging concern over potential conflicts between routing costs and best execution.

"A lot of the buy-side have been asking for FIX tag 30 data to get a better view of where the sell-side are executing their orders, some to ascertain whether a broker is choosing a venue for its own economic advantage, others to get a better understanding of comparative venue performance, perhaps with a view to routing direct," says SS&C's Moitoso. Most brokers are

able to supply FIX tag 30 data but say buy-side firms might not receive uniform information from different counterparts. "Naming conventions for venues are not yet standardised and two different brokers might call the same alternative trading system by two different codes," he notes.

As well as tag 30, David Hagen, director of strategic accounts at technology provider Linedata, says buy-side trading desks are now also mining tags 29 and 851 in pursuit of better execution performance. On a FIX message, tag 29 reveals whether the broker acted as agent or principal on a trade while tag 851 shows whether it added or took liquidity on a maker-taker venue. "What they are looking for next is the 'hops along the way', the trail of breadcrumbs left behind by a trade as it goes from venue to venue in search of fills," explains Hagen. "Some long-only asset managers might be concerned that they are leaving information that HFT firms can feed off, but for others it might be more about order routing transparency, i.e., to identify where the broker sent a trade before it was finally completed," he says.

### Information asymmetry

As long as there is money to be saved, the buy-side will continue to dig into the data. The increased granularity of TCA represented in Barclays' venue analysis is also evident in data provider Markit's offering, Trade EQM, a trading analytics platform that leverages the acquisition of Quantitative Services Group in November 2011. Trade EQM analyses fills individually and benchmarks each order's adverse ticks against overall ticks for the stock in question across the lifetime of the trade. By using both historical recent market data and dynamic in-trade metrics such as bid-ask spreads and the probability of adverse ticks to estimate cumulative price impact based on size of order.

Information asymmetry between the sell-side and buy-side has narrowed dramatically in the past decade or two. Following from the maxim that knowledge is power, the recent flood of automated and digitised information has both shifted the balance of power between the buy- and sell-side and changed the nature of brokers' execution services, with the sales trader playing second fiddle, or at least sharing the limelight, with

the electronic sales trader or execution consultant.

First, the proliferation of market data terminals took away the sales trader's role as purveyor of market-moving economic statistics. Then, the flow of 'first call' opportunities dried up, partly due to a cyclical drought in IPOs but also prompted by a more long-term change in the distribution of research. Finally, improvements in buy-side technology put institutional investors' dealing desks on the same page as their brokers in terms of depth of book market data.

But J.P. Morgan's Troise asserts that high-touch plays a key role in execution services. "Brokers can still differentiate high-touch services from the rest of the market," he says. "For example by the way they identify natural liquidity, how they apply capital to a client trade, and how they put to work the range of execution tools on behalf of the client."

That may be so, but the scope of execution is continuing to expand from algorithmic to all client flow and across asset classes. "We're now customising our futures algos as well as those deployed in the equity market," says UBS's Susi. ■