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DIY EXECUTION ANALYSIS

Stuart Farr of Deltix discusses the merits of firms maintaining their own historical market data archive and using this to improve trading performance through advanced execution analysis
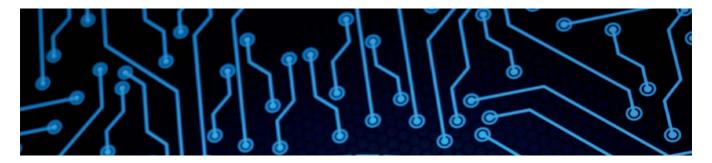
Historical Market Data

In discussions with new clients, we are usually asked recommendations for providers of historical market data. Having worked with several such providers, we make suggestions based on the requirements of the client, the most important of which is the granularity of data required: daily bars, minute bars, tick (best bid/offer and trades) or market depth. Unsurprisingly, cost increases as the granularity of data increases.

However, the best answer is not to buy historical market data at all: rather, to record the real-time market data currently used for trading (assuming not a start-up firm). The surprising observation we have made is that many trading firms today do not record the market data flowing through their pipes. Given the costs (data vendor, infrastructure and exchange fees) already incurred in provisioning market data, it is curious why this valuable resource is, in many cases, allowed to flare off like unwanted natural gas.

Other than the cost of purchasing historical market data, it is highly advantageous to record the market data flowing through your own production trading system for other reasons. For example, in doing so, you are capturing all of the latencies and idiosyncrasies inherent in your own infrastructure. With trading strategies and analysis which requires daily data only, this matters less. Where trading strategies or analysis require tick data or market depth data (as in execution analysis), capturing all of the latencies and idiosyncrasies baked in your own environment is very valuable. Particularly in FX, with the diversity of sources and client-specific

nature of much liquidity, using the source of data used in production trading is even more essential than for futures.

But let's remind ourselves why we need historical market data at all. The first reason is execution analysis (sometimes known as Transaction Cost Analysis – TCA), which is relevant for both system and discretionary trading firms. The second reason, for systematic firms, is as a resource for back-testing candidate alpha generating strategies.

Execution Analysis

The importance of recording market data on your own production trading environment was discussed earlier. In the case of doing forensic execution analysis, it is doubly necessary as the time-stamping of orders, executions and market data needs to be fully sequenced. TCA has traditionally been used to demonstrate best execution for fiduciary or compliance reasons. This has been, and remains, a useful and valuable capability. But intertwining orders, executions with market trades and the states of the order book at the time of each execution is a different order of analysis. Such forensic execution analysis may not be required on a continuous basis, but is essential when there is an unexpected or unexplained change in execution quality. This is particularly important for intraday trading strategies in which profit per trade is usually low and so achieving 'good' execution via limit orders is simply essential. 'Good' is defined by minimising the loss of potential profit on each trade and will vary with each strategy. In essence, if the potential profit of a trade at signal-generation time is on average $10, then losing on average more than $5 in between then and actual execution requires improvement. Clearly, good execution is not going to turn a poor alpha generating strategy into a good one, but it is vital to maximise the realised profit from a good alpha generating strategy.

For orders executed algorithmically, ongoing execution analysis is essential. Outside of keeping track of the performance of any broker execution algo a firm might be using, a trader needs to know how they are performing in respect of the chosen benchmark (usually arrival price or the VWAP of market trades over the life of the order). This ongoing analysis will provide comfort or alert to unacceptable changes in execution quality in respect over/ underperformance measured in both ticks and Dollar value. Secondly, a trader can use execution analysis to look for patterns of over/under performance. For example, for a given period, do all orders achieve similar out performance relative to the chosen benchmark: on each day of the week, for all order sizes, for all markets?

tinction here is doing execution research in a vacuum caused by using market data not recorded by the firm and/or not being able to change algo selection and parameterisation in production such that the trader can implement the research findings and immediately see the results. There is nothing like showing real dollar improvement to keep researchers, technologists and traders focused. Incorporating such feedback on a next day basis is laudable. The holy grail of course is having fully adaptive algos: that is, those that change

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The answer is likely to be 'no' to at least one of these and so provide opportunities for improvement in either algo selection, algo parameterisation or both. Drilling deeper by capturing the underlying market data, we can look for patterns of algo performance versus participation rate: are we sacrificing performance by trying to get executed too quickly? Is loss of execution performance a price worth paying because of improved alpha performance and so better P&L overall?

The above examples imply significant effort expended in experimental analysis and study. Our view is that such time is demonstrably very worthwhile. However, we often observe managers struggling with their data infrastructure. Such managers are not recording market data in their production trading system and much energy and expense is expended in procuring the market data and merging it with orders and executions.

Improving Trading Performance

Another key to success is to demonstrably and frequently improve trading performance by such fine-tuning of execution. The dis-

their behaviour in real-time in response to real-time market data. Ironically, such real-time feedback loops are part and parcel of systematic trading but it is still a relatively new concept in execution algos used in discretionary trading. It is unclear whether this is due to less sophisticated technological capabilities at discretionary trading firms or whether human traders at such firms are reluctant to hand over control to a machine. One way to institute real-time modification of execution algos is to provide the (human) trader the ability to dynamically change attributes. In that way, ideas for improving execution generated by the research team can be implemented, manually. As comfort and acceptance is achieved, these real-time adjustments to the running algo can be implemented automatically. ▢

Stuart Farr is is president of Deltix, the provider of technology for quantitative research and trading. Stuart has over 20 years of experience in financial technology. Previously, he was CEO and co-founder of hedge fund software provider Beauchamp Financial Technology and head of Credit Risk Technology at Credit Suisse First Boston.