A closer look at the Signal V6 performance that early adopters are seeing on their dark pegged orders.

IEX Exchange recently launched an optional new version of the Signal, the proprietary mathematical model powering our dark pegged order types like D-Peg and P-Peg. The Signal is designed to predict imminent NBBO price changes and restrict Signal-powered orders from exercising their full discretion and trading at moments of price instability where the chance of adverse selection is high. This newest version, Signal V6, is designed to predict more price changes than our previous version, V5, while maintaining a similar level of accuracy.

Signal V6 has now been running in our production system for about 10 weeks – longer than it has been available for use by clients. As a result, we can determine for every trade which took place on IEX Exchange during that time frame whether Signal V6, Signal V5, or both, were active at the time. Using this information, we can analyze the hypothetical effect of Signal V6 on D-Peg and P-Peg orders by comparing the trades when Signal V6 was on versus when it was off, regardless of which Signal (if any) the orders utilize. Let's take a closer look.

How Signal V6 Impacts D-Peg Performance

Looking across all trades from D-Peg day orders at IEX Exchange, we see that about 5% to 6% of notional value traded occurs when Signal V6 is on. As a reminder: when the Signal is on, the chance of being adversely selected is high and it's not a good time to execute your trade – which is why our Signal-powered order types reprice (or cancel) your order out of harm's way. This number represents the potential effect of switching to Signal V6, both in terms of potential additional protection, as well as a maximum on the range of potential fill rate decline. It's also important to note firms can still "make up" these trades prevented by the new Signal: by trading after the Signal turns off and their orders can exercise their full discretion.

How different are D-Peg trades that execute when Signal V6 is on? The most striking difference is in the types of contra parties that D-Peg orders trade with. While Signal V6 is off, 61% of D-Peg notional value traded is against Institutional Broker contra parties, compared to just 25% when Signal V6 is on.

While we as an exchange often focus on delivering better markouts and optimizing trade-by-trade results, we recognize that our clients often focus on parent-level order performance and minimizing metrics such as slippage vs. arrival. We believe that interacting with like-minded market participants can help to improve parent-level performance, and therefore that D-Peg (and Signal V6 specifically) can be a key tool towards achieving that goal.

As a point of comparison, we can look to see how this contra party breakdown compares against that of other pegged order types on IEX Exchange: D-Peg when Signal V5 is off, and M-Peg, our standard Midpoint Peg order type (which does not leverage the designed protection of the Signal). By this measure Signal V6 represents a nice incremental improvement, as you can see below.

Looking at markouts, a measure of adverse selection, we see that they quickly become 5% to 6% of spread more negative when Signal V6 is on. While 5-6% of spread might not sound like a lot, Institutional Broker VWAP algo performance is often measured in fractions of a basis point or a single percentage of spread, so little improvements can add up to meaningful performance differences.

When we compare these markout results for D-Peg when V6 is off to D-Peg when V5 is off, as well as M-Peg, we see that V6 again represents an incremental improvement.

Once again, we note that the difference is not dramatic, but it is there. In a world where the difference between the best and worst performing algos can often be slim, we continue to innovate to provide our clients with opportunities to further improve performance.

The Impact of Signal V6 on P-Peg Performance

Next up is the P-Peg, or Primary Peg, order type. When you dive into the performance of P-Peg trades on IEX Exchange, the potential benefit of switching from Signal V5 to Signal V6 looks even larger than for D-Peg! We can see that 11% of notional value traded occurs when Signal V6 is on. Again – the goal is to minimize the number of trades that execute while the Signal is on, as it indicates high likelihood of adverse selection for your order. Notably, 11% of trades that execute when the Signal V6 is on trade against Institutional Broker contra parties just 17% of the time, versus trading with an Institutional Broker 52% of the time when V6 is off.

Additionally, markouts of those trades when V6 is on are 17% to 22% of spread more negative compared to when the Signal V6 is off, at time horizons up to one second.

This dramatic difference for P-Peg orders is likely due to the types of orders that P-Pegs interacts with most often. By virtue of being a more passive order type, the default behavior of P-Peg orders is to buy on the bid or sell on the offer (unlike D-Peg, which primarily trades at the midpoint). As a result, P-Peg orders are much more likely to interact with spread-crossers which, by their very nature, are more likely to be market-moving orders. Therefore, identifying situations in which spread-crossing orders are most likely to change the NBBO is more impactful to reducing adverse selection.

Encouraging Initial Performance Data for Signal V6

We are encouraged by these early results indicating the potential for Signal V6 to help further reduce adverse selection for our broker-dealer Members. In the past weeks, we have seen many firms adopt Signal V6 outright or as part of A/B tests. Early results are by and large as expected and we hope to share additional details once we have sufficient sample size.