

Tick Size Pilot Program

On May 6, 2015, the SEC issued an order approving a plan under the National Market System (NMS) for the National Securities Exchanges and FINRA to implement a Tick Size Pilot Program, which is a data-driven test to evaluate whether or not widening the tick size for securities of smaller capitalization companies would positively impact trading, liquidity, and market quality of those securities. The program will commence October 3, 2016 in phases, with a full roll out completed on October 31, 2016.

Clearpool AMS Tick Size Pilot strategy amendments

Clearpool has undergone extensive analysis and research on all venues to best understand how each will handle order acceptance and placement regarding the Tick Pilot securities and we will honor each market center's rules. Of note is that for Test Group 3 securities, most ATSs have not implemented the Block-Size Exceptions, as they are refraining from filing amendments to their Form-ATS. In addition, some will be rejecting Peg-Prime and Peg-Market orders as they cannot execute at the bid or offer due to the Trade-AT requirement for hidden orders while some will accept and only execute under the "block-size exemptions". As a result we will be adding configurations for each ATS to optimize behavior on a best-effort basis. The amendments made to our strategies to accommodate the Tick Size Pilot program are outlined below.

For all test groups Clearpool will only accept Limit orders priced in \$0.05 increments. Limit orders not priced in \$0.05 increments will be rejected.

Control Group

There will be no change to how orders are accepted or handled.

Test Group 1

We will only accept orders priced at \$0.05 increments, however we will continue to trade orders at or within the spread to the extent at which it is possible.

Test Group 2

We will only accept AND trade orders priced at \$0.05 increments, however we will continue to access liquidity at the mid-point and at or within the spread at nickel increments when possible.

Test Group 3

We will only accept AND trade orders priced at \$0.05 increments, however we will continue to access liquidity at the mid-point and within the spread at nickel increments when possible. We will also access full spread liquidity for block sized orders, as well as for smaller orders via our advanced queue prioritization technology.

Impact on strategies

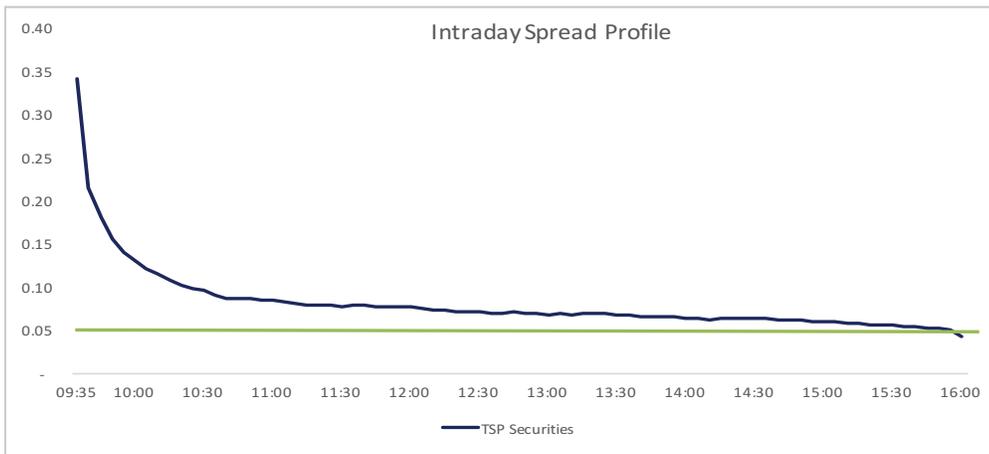
- **SOR Urgency 3 & 4 and DarkAgg Urgency 4 & 5** requires no change on the strategy level however since the Ping-Touch element can violate the Trade-AT requirement, orders will either access liquidity within the spread at nickel increments, or at the touch if the ATS has implemented block size exemptions and the child order slices are large enough.
- **DarkAgg Urgency 1 & 2** requires no change on the strategy level however, we anticipate Peg-Prime orders for these securities will have very low fill rates due to the ATS handling previously noted.
- **I Would Price** limits will be adjusted to comply with \$0.05 increment requirement.
- **Stop Limit Price** for DMA orders will be adjusted to comply with \$0.05 increment requirement.
- **Ping Dark Price Improvement 3/4th spread** functionality will be adjusted to factor in the nickel tick size requirement. It will still round aggressively to the next nickel increment however if this results in a limit that is at the NBBO-Touch, then this phase will be skipped and the strategy will move to the Ping-Touch phase.

Will it accomplish the intended goal?

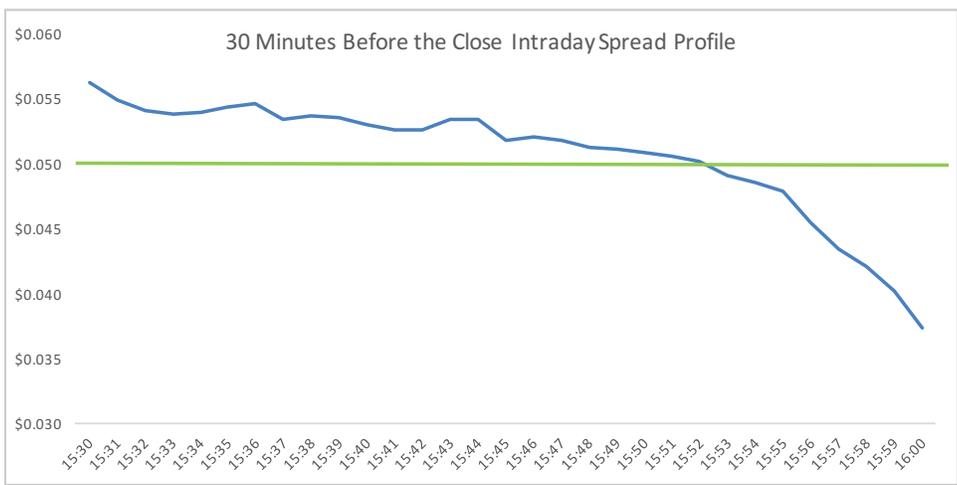
One of the main concerns that spawned the pilot program was that penny spreads in these small cap companies had a diminishing effect on the profitability of market making that broker dealers could no longer justify analyst resources to cover these companies. As a result there was significantly less investor interest in these companies resulting in fewer IPOs over the years. There has been significant discussion as to whether penny spreads are actually the main cause in the decrease of small cap IPOs and if the Tick Pilot Program will actually have the desired effect on spread widening.

It is evident in the stats, that most of the securities in the program already trade at spreads much wider than a penny. Spurring the notion that moving to nickel spreads will not necessarily increase the bid-ask spread significantly, if at all.

Spreads for the Tick Pilot securities are significantly wider in the minutes after the opening and increasingly tighten as the day goes on, leveling off between \$0.05 and \$0.10 for the majority of the day. Of note is how the spreads tighten below \$0.05 in the last 15 minutes of the day when volume and liquidity are the most prominent, heightening interest around the effects that an artificial barrier of wider spreads may have in late day trading around the close.



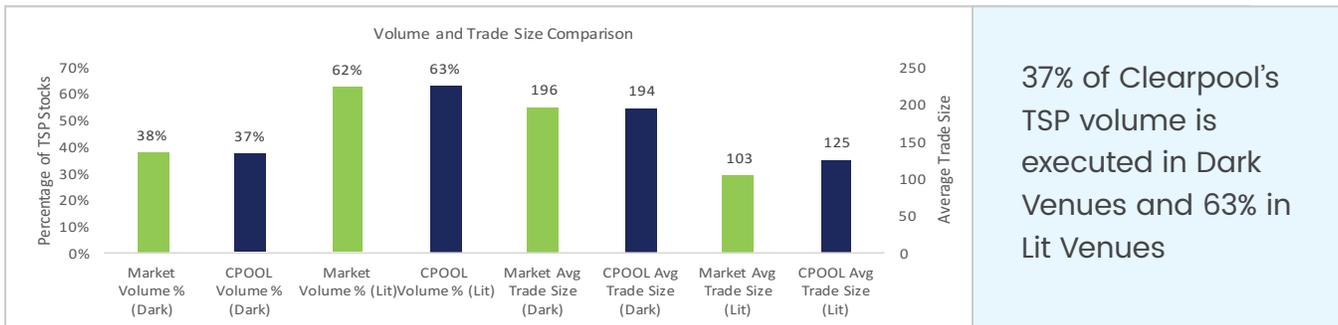
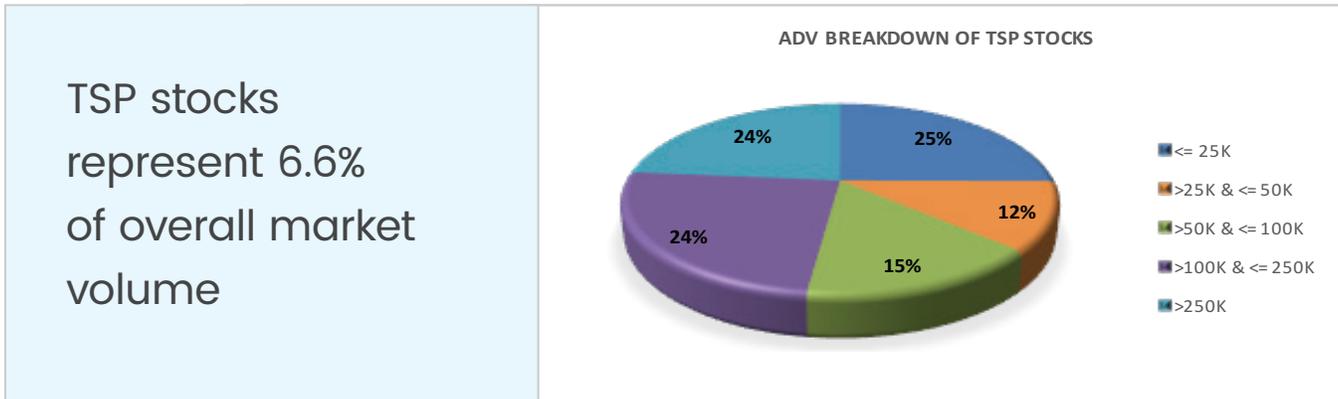
Spreads tighten below \$0.05 in the last 10 minutes of the day when volume and liquidity are the most prominent



Questions about Tick Size Pilot? Contact the Help Desk at [212.531.8543](tel:212.531.8543) or helpdesk@clearpoolgroup.com. Or you can contact Sales at [212.531.8545](tel:212.531.8545) or salesteam@clearpoolgroup.com.

Will Tick Size Pilot move more volume to the dark?

In addition to the effect on spreads that the Tick Pilot may have, it will also be of interest how average trade size is affected as well as the percentage of volume traded in dark pools versus the percentage of volume traded in the lit markets for these securities. One intention of the pilot is to draw liquidity out of the dark pools and onto the lit markets via the Trade-AT constraint (Test Group 3) as well as increase the average trade size for all securities by forcing more liquidity to trade at fewer price increments. It will be interesting to see how these effects will play out over the two year program and Clearpool will be tracking key metrics to continuously analyze such effects.



Additional Resources

Test Groups Symbols: http://www.finra.org/sites/default/files/Tick_Size_Pilot_Rollout_List.xlsx

TSPilot Securities: http://tsp.finra.org/finra_org/ticksizepilot/TSPilotSecurities.txt

TSPilot Changes: http://tsp.finra.org/finra_org/ticksizepilot/TSPilotChanges.txt

Questions about Tick Size Pilot? Contact the Help Desk at 212.531.8543 or helpdesk@clearpoolgroup.com.
Or you can contact Sales at 212.531.8545 or salesteam@clearpoolgroup.com.

Methodology

The Tick Size Pilot will include companies with \$3 billion or less in market capitalization, an average daily trading volume of one million shares or less, a closing price of \$1.50 or above, a volume weighted average price of at least \$2.00 for every trading day, and an IPO date before April 3, 2016. In addition, no ETFs will be included in the program.

The market cap of these companies may be relatively small in scale, however the impact of this program on overall markets should not be diminished. With nearly 1,200 stocks affected, the Tick Size pilot will ultimately have impact on over 14% of all US listed equities.

The methodology for each test group is below:

- **The control group** of approx. 1,200 stocks will have no change as to how these securities are quoted or traded, or to how orders are accepted.
- **The first test group** of approx. 400 securities will be quoted in \$0.05 increments but will continue to trade at current price increments, including penny increments at or within the spread. Most brokers and trading centers will only accept limit orders priced in \$0.05 increments while trading centers will cross, execute, or fill orders at ANY price.
- **The second test group** of approx. 400 securities will be quoted and traded in \$0.05 increments. Most brokers and trading centers will only accept limit orders priced in \$0.05 increments while trading centers will only cross, execute, or fill orders at \$0.05 increments. There will be exemptions allowed for midpoint, benchmark contingent and retail trades.
- **The third test group** of approx 400 securities will be subject to the same requirements as the second test group, however orders will be subject to the "Trade AT" requirement, meaning hidden orders cannot trade at the bid or offer without fulfilling all lit venues displaying the same price and size. There will be an exemption for block orders equal to or greater than 5000 shares or \$100,000.

Date	Live Symbols
October 3, 2016	5 symbols in Test Group 1 and 2
October 10, 2016	100 symbols in Test Group 1 and 2
October 17, 2016	All symbols in Test Group 1 and 2; 5 symbols in Test Group 3
October 24, 2016	All symbols in Test Group 1 and 2; 100 symbols in Test Group 3
October 31, 2016	All symbols for Test Groups

Questions about Tick Size Pilot? Contact the Help Desk at [212.531.8543](tel:212.531.8543) or helpdesk@clearpoolgroup.com.
Or you can contact Sales at [212.531.8545](tel:212.531.8545) or salesteam@clearpoolgroup.com.