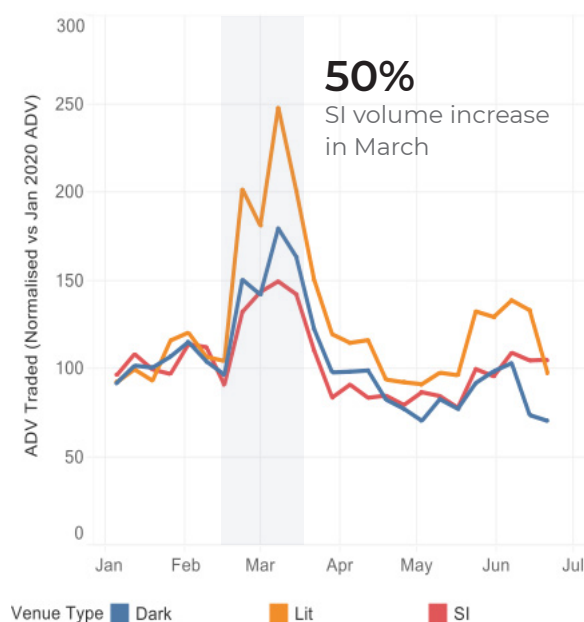# Systematic Internalisers in Volatile Markets

INTRODUCTION

The volatility experienced during the first half of 2020 prompted changes to the way algorithms interacted with various liquidity sources. In Europe, one liquidity source available to algorithms are Systematic Internalisers (SI). In this paper, we examine how SI operators adjusted their liquidity provision over the volatile period, and how Virtu's Frontier execution algorithms adapted their interactions.

Figure 1: SI Public Volumes
By Venue Type

50%
SI volume increase in March

Figure 2: SI Public Volumes
SI Share of All Trading

-25%
SI market share drop in March

Source: Cboe https://markets.cboe.com/europe/equities/market_share

The above charts show the publicly reported volume of lit, dark and SI venues over 1H 2020. We can see that, on a normalized basis, SI volumes increased 50% in March **(Figure 1)** before dropping to below January's baseline until June. This follows a very similar trajectory in dark market usage. Lit markets were the main beneficiary of the volume spikes, increasing over 100% in March and trading consistently at, or above, January's baseline ever since. If we plot the relative share between the venue types we see that the market share for SIs dropped 25% during March **(Figure 2)**, then slowly recovered before having another dip in June.

The dataset used in this whitepaper covers all SIs, of which there are two broad categories: electronic liquidity providers **ELP SIs** and **Bank SIs**. Unfortunately, from public trade reports it is not possible to break the datasets down any further, but we can compare how our own algorithms interacted with several ELP SIs so that we may gain additional and meaningful insights. At present, Virtu Frontier execution algorithms can access Virtu Financial (VFSI), Citadel Securities (CCEU), Hudson River Trading (HRSI/HREU), Jane Street Financial (JSSI), Jump Trading (JLEU), SSW Trading (SSWM) and Tower Research (TRSI).

To keep the analysis consistent over the whole time period we have excluded:

· Jump Trading as they were onboarded in May

· An additional quote stream from Citadel introduced in May
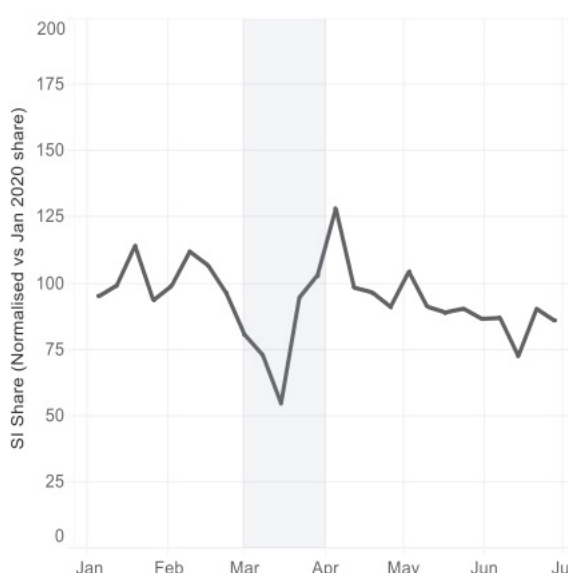
Figure 3: Virtu Algorithms
SI Volumes by SI
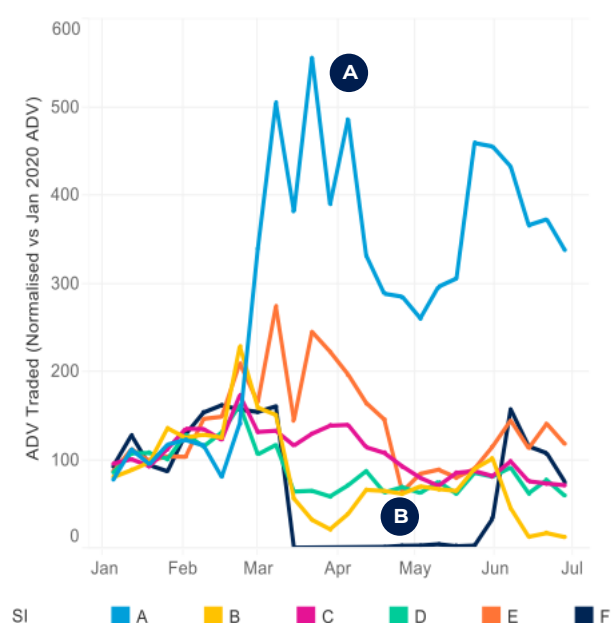
Figure 4: Virtu Algorithms
SI Share of All Trading

Source: Virtu Financial

When reviewing individual SI data (the SIs Virtu's algorithms access), it is clear that reactions to the volatility differed. Most SIs increased their volumes in line with the market at the end of February but in March things changed significantly. SI A increased their willingness to provide liquidity by five times their "normal" volumes **(Figure 3-A)** which far exceeded the twofold increase we observed in lit volumes. SI E also managed to trade increased volumes throughout the main period of volatility.

At the other end of the spectrum, SI F stopped trading entirely **(Figure 3-B)** and did not resume (tentatively) until May. SI B also had two significant drops in March and June. The reduction seen in SI C was mostly due to the share increase in SI A as their quoting characteristics tend to be similar, rather than any reduction in willingness to trade.

In terms of the relative share SIs represented in Virtu's algorithmic trading, it is a similar story to that observed in the public markets **(Figure 4).** Although SI volumes increased on a notional basis, they increased less than the trading our algorithms did on lit and dark venues. SIs dropped in their share of our algo trading by almost half in the middle of May before quickly rebounding to their normal proportions—unlike in the public markets where the SI share was depressed for a longer period.

## EVOLVING SI USAGE BY ALGORITHM TYPE

Rather than simply looking at overall volumes traded, a closer look at interactions by algorithm type can offer more granular insight into how SIs changed their appetite for trades over the period of volatility.

Liquidity seeking algorithms are watching for opportunities to trade in size much larger than are typically available in the lit markets, whereas standard SOR orders are smaller sized and more focused on price.

Figure 5: SI Share by Algorithm Type
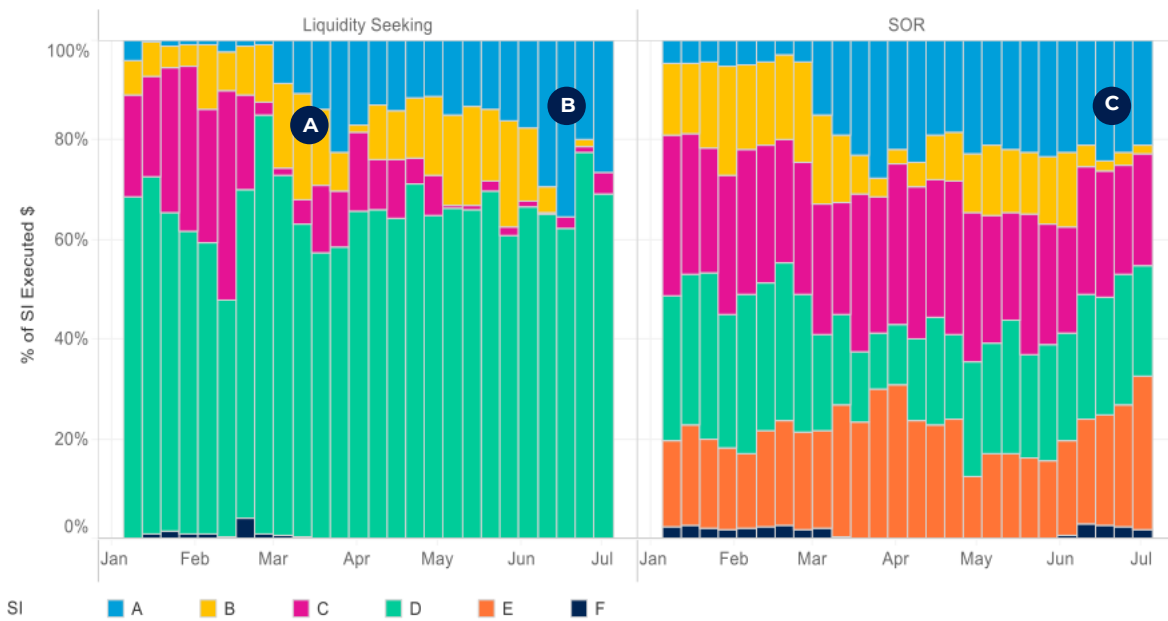
Figure 6: Average Trade Sizes
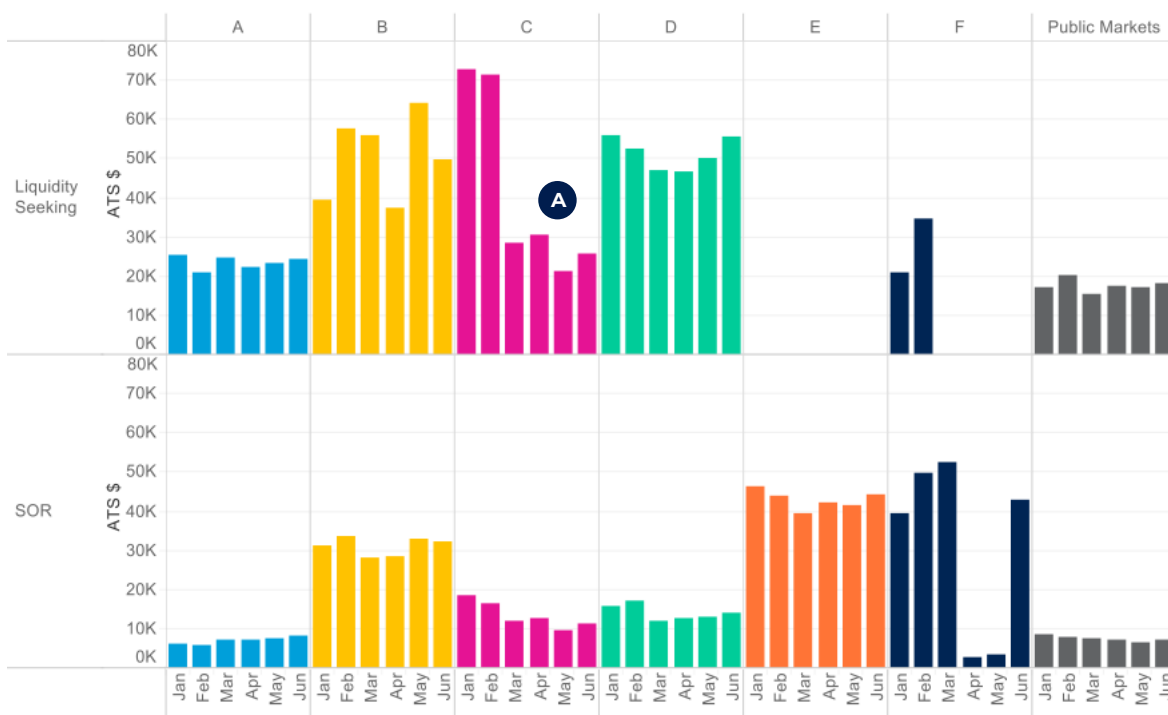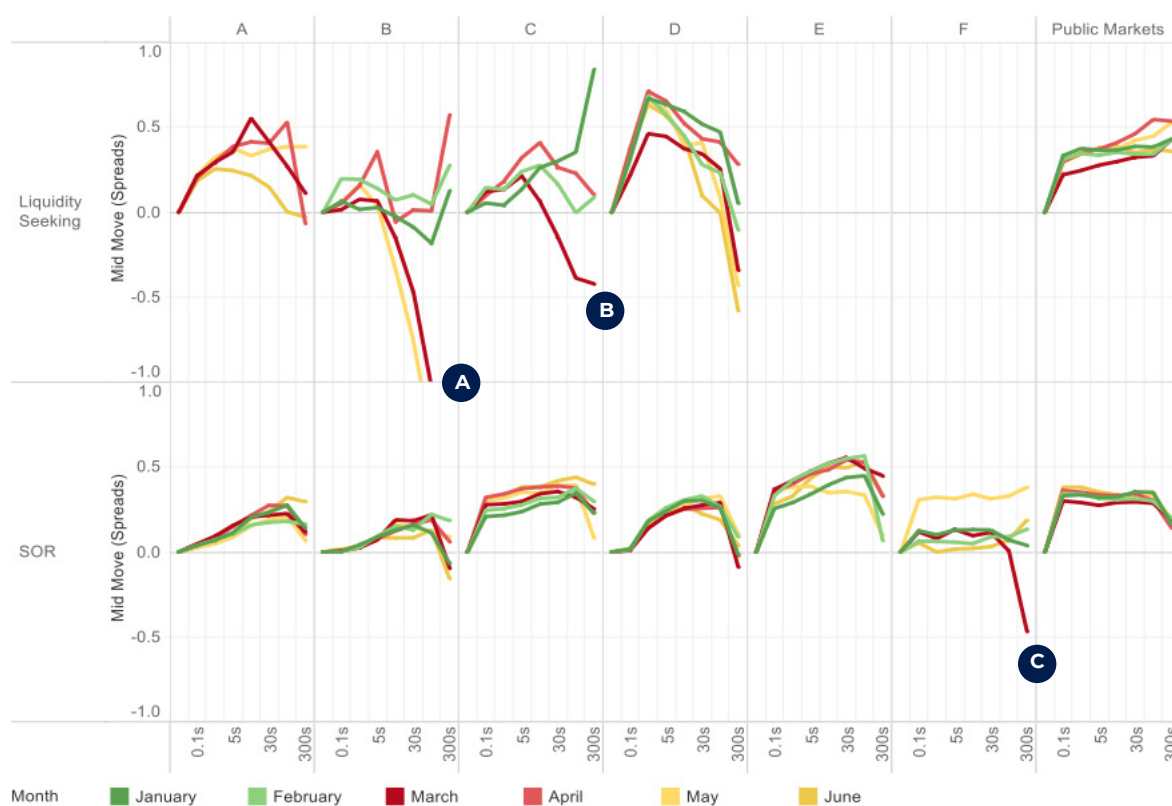

Source: Virtu Financial

SI A's increase in volumes is not just focused on a certain algo type but reflects its ability to supply liquidity to both types of algorithm in this comparison. For the SOR order interactions, SI A gained plenty of share over the other SIs by providing more frequent quotes at the European Best Bid and Offer (EBBO).The distribution of SI usage in our SOR is evenly distributed across the SIs before and after the most volatile period of March, with SI A effectively swapping share with SI B. The sameness reflects both the consistency with which the SIs are quoting at competitive prices (i.e.: in line with EBBO) as well as our logic for real-time ranking SIs on price, size and concentration to ensure we are using them all efficiently.

The most significant deviation in normal SI venue usage observed was seen in our liquidity seeking algorithm. Here SI C steps away from providing as many opportunities to trade in significant size at the start of March **(Figure 5-A)**. This recovered partially in April before disappearing again in May and is yet to return—suggesting a more long-term change in approach. SI B experienced something similar in late March and again in June, which appears broader as it impacts its trading with both liquidity seeking and SOR type algorithms (**Figure 5-B & C)**. SI D remains the dominant SI in the liquidity seeking category as it provides a guaranteed EBBO-size stream of liquidity.

If we consider the trade sizes (and implicitly quote sizes / presence) by algorithm type we see more clearly what happened to SI C—which, by substantially reducing its quote size (**Figure 6-A)**, became less attractive to a liquidity seeking algorithm. On the other hand, SI C did maintain its presence in smaller size which is arguably more important for a SOR. All the other SIs have maintained their sizes despite the volatility.

Figure 7: Performance Markouts

Source: Virtu Financial

Whilst performance is measured across many dimensions, one common proxy used is markouts i.e.: what happens to prices in the market after a trade is done with a venue? The charts above illustrate the price evolution of the market midpoint after the trade with an SI by algorithm type (and the lit market as an additional comparison point). This reveals some interesting insights into the changes made by SI B and C in the liquidity seeking category and why perhaps there were no real changes to most SIs in SOR flow.

Where the markouts deviated significantly from "normal" **(Figure 7-A, B & C)** there is a corresponding change by the SI to adjust its quoting, either by stopping entirely or reducing that interaction through small quote sizes / less quote frequency. Overall, however, most SIs were able to maintain comparable levels of performance before, during and after the peaks of the volatility.

CONCLUSION

Following our observations of the first half of the year, we continue to regard ELP SIs as valuable sources of liquidity. No major adjustments to our algo routing logic were required despite the evolving nature of the liquidity during this period because Virtu SOR and algo integration provides the algorithms with real-time visibility into the opportunity set and our built-in, venue-tailored, logic helps maximize the benefit of interacting with each unique liquidity source.

ABOUT VIRTU

Virtu is a leading financial services firm that leverages cutting-edge technology to provide execution services and data, analytics and connectivity products to its clients and deliver liquidity to the global markets. Leveraging its global market making expertise and infrastructure, Virtu provides a robust product suite including offerings in execution, liquidity sourcing, analytics and broker- neutral, multi-dealer platforms in workflow technology. Virtu's product offerings allow clients to trade on hundreds of venues across 50+ countries and in multiple asset classes, including global equities, ETFs, foreign exchange, futures, fixed income and myriad other commodities. In addition, Virtu's integrated, multi-asset analytics platform provides a range of pre and post-trade services, data products and compliance tools that clients rely upon to invest, trade and manage risk across global markets.

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