



The Swiss Stock Exchange

Trading InfoSnack #08: This Time Is Different

27 May 2021

This Time Is Different

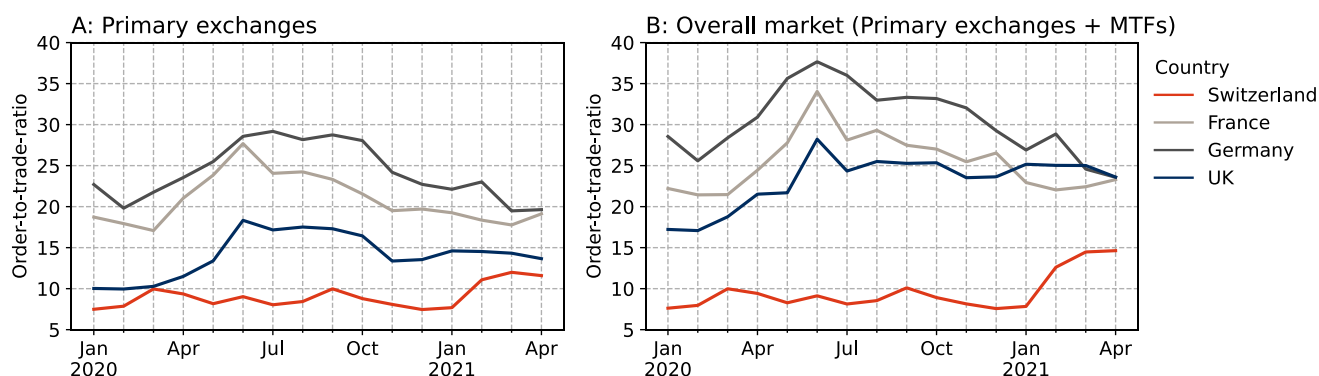
In this article we look at differences in order book dynamics across major European markets. We compile them together with the Swiss market during the non-equivalence period and during the last few months following the return of competition. This allows us to draw some insights about differences in order book structures across periods and venues (primary exchanges and MTFs) as well as comment on order book changes as a result of competition returning in the Swiss market.

The European landscape of equity order book design has some homogenous elements across different countries. It includes a harmonized tick size regime, which plays an essential part in order book dynamics. Other aspects that are meaningful but can vary across jurisdictions are restrictions on dark pool trading, different index concentration, the level of competition (or its absence, which is relevant for the analysis of the Swiss market), the local trading community and others. We will refer to some of these aspects when analyzing our results below.

In Chart 01, we compute Order-to-trade (OTR) ratios for the lit books in continuous trading. OTR is measured as the ratio of the number of resting lit orders to the number of executed orders. Chart 01 A shows OTR for primary exchanges in their respective Blue Chip indices. The Swiss Stock Exchange reports the lowest OTR ranging below 10 over most of the sample period. OTR for other primary exchanges oscillates between 15 and 30 with the peak values in June 2020. From that point onwards we observe a synchronized decline across the other Exchanges. At the same time, OTR for the Swiss Stock Exchange noticeably increases to over 10 with the return of competition in Swiss equity trading.

Chart 01 B plots OTR that includes MTFs in the corresponding Blue Chip Indices. One can immediately notice higher level of OTR values for all markets, suggesting a high effect of MTFs on aggregate OTR measures. This observation is common across all markets we looked at and the magnitude of that impact appears to be correlated with fragmentation. When comparing the numbers for April 2021, the delta between the OTR for primary exchanges only and the overall market (incl. MTFs) is highest for the UK (9.9) and lowest for Switzerland (3.0).

Chart 01: Order-to-trade ratios in European Blue Chip shares

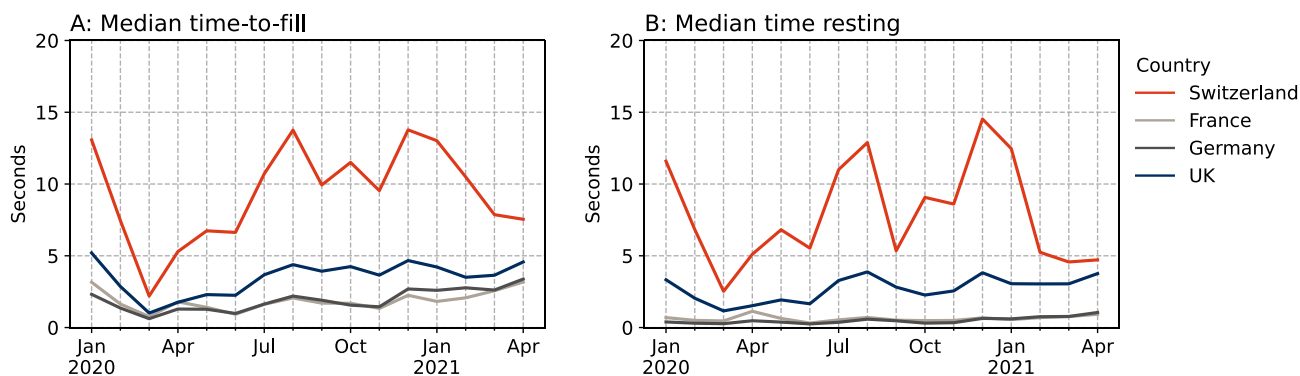


Data source: BMLL, SIX | Securities: Blue Chips | Venues: Primary exchanges and MTFs (Aquis, Cboe BXE, Cboe CXE and Turquoise)
Sample period: 01 Jan 2020 - 30 Apr 2021 | Sampling frequency: Monthly
Methodology: Order-to-trade ratio is computed as the number of resting lit orders divided by the number of executed orders.

Next, we are moving to the order book metrics based on order duration. In particular, Chart 02 contains the following metrics: i) Time-to-fill on Chart 02 A and ii) Time resting on Chart 02 B. Both are computed exclusively for primary exchanges and contain orders entered at the Best Bid and Offer (BBO). The Swiss Stock Exchange appears as an outlier, exhibiting the highest Time-to-Fill but also the longest resting time of orders. In addition, there is a significant amount of fluctuations for both metrics in particular for the Swiss market. There is clear impact of volatility from the last year: a significant spike during the holiday period as well as some normalization with the competition returning were observed during this period.

As for the other Exchanges, we see very similar dynamics across markets, particularly for the Time-to-fill. What stands out is a very low median resting time of BBO orders in Germany and France, oscillating around 1-1.5 seconds. This begins to be explained by a large number of Blue Chips stocks which are not tick constrained in these markets. As for the Swiss market, the depth of the order books in the Blue Chip stocks tends to be much greater than other markets. This is in part driven by the high proportion of value traded in Nestle (NESN), Novartis (NOVN) and Roche (ROG). These securities all feature in the top 5 securities by market cap in Europe and are characterised by large orderbook depth and tick stability. Greater price stability sees less order amendment to remain at the BBO price level, meaning the contribution of these securities could be a source of the divergence we observe below in the different markets OTR from Chart 01. The absence of competition in Swiss equities in 2020 and the resulting consolidation of liquidity has further amplified the differences between markets. Price discovery being limited to one venue leads to less cross-venue signalling and queue jostling, promoting more patient passive activity and a lower OTR.

Chart 02: Resting and fill behavior of orders across European Blue Chips

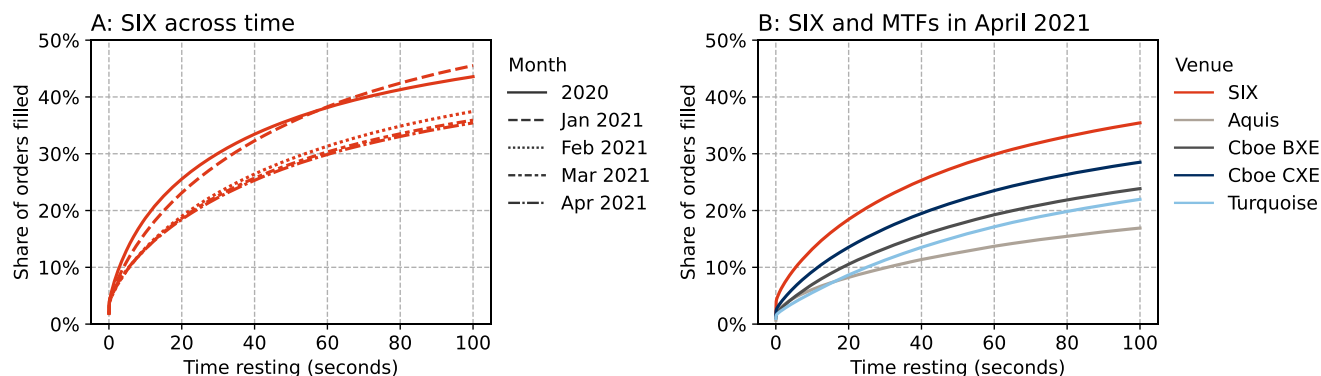


Data source: BMLL, SIX | Securities: Blue Chips | Venues: Primary exchanges
 Sample period: 01 Jan 2020 - 30 Apr 2021 | Sampling frequency: Monthly
 Methodology: Time-to-fill and time resting are computed for orders submitted at BBO.

In the concluding part of this InfoSnack we bring the focus back to the Swiss market. Building on the results described above, we compose a measure of probability of order fill. In Chart 03 A we plot the share of orders filled against the time resting. To no surprise, we find the marginal growth rate for the share of orders filled to diminish over time resting. We observe that with the return of competition in February 2021, the curve of the probability of fill on the lit book of the Swiss Stock Exchange shifts down. As an example, the probability of fill decreases by about 5% for an order submitted at the BBO and resting 20 seconds under competition compared to consolidation. When plotting the probability of fill for the primary exchanges and MTFs separately in April 2021 on Chart 03 B, we get a dispersed set of curves for the venues. While SIX demonstrates the highest chance of filling an order, CBOE CXE book follows and accounts for the

highest probability of fill among the MTFs. Market share can play an essential role in explaining this result. CBOE has its the highest market share among MTFs. However, Aquis who ranks second highest MTF by market share displays the lowest probability of fill. This is likely due to differences in Aquis market model, which results in a reduced aggressive activity in their books.

Chart 03: Probability of fill in Swiss Blue Chips



Data source: BMLL, SIX | Securities: Swiss Blue Chips

Sample period: 01 Jan 2020 - 30 Apr 2021

Methodology: Probability of fill is computed for orders submitted at BBO using the Kaplan-Meier estimator.

To conclude, we find that the Swiss market is subtly different to other primary exchanges in the selected liquidity metrics. This is only partially driven by the lack of competition until February 2021 and the consolidation of liquidity on one venue, as other factors were also in play. We believe that both the concentration of Swiss equity trading around the hyper-liquid stocks as well as a very strong local trading community that typically 'trades in size' are likely key differentiators for the Swiss market.

When looking jointly at all three charts, we learn a valuable insight from the period of consolidation of the Swiss market. On the one hand, with the return of competition in Swiss equities, the median time-to-fill goes down. This suggests a positive development on the market. On the other hand, the OTR increased with competition, which implies a lower fill rate of orders, and the median resting time declined in sync with time-to-fill. Collating these these observations into one unified analysis of order survival, we find a decreased probability of fill associated with the return of competition in 2021, suggesting that the overall impact of consolidation may not be all positive. The fragmentation in Swiss equities still evolves and we continue to monitor the ongoing developments.

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