The Swiss Stock Exchange

Trading InfoSnack #01: What's in a Liquidity Smile?

14 May 2020

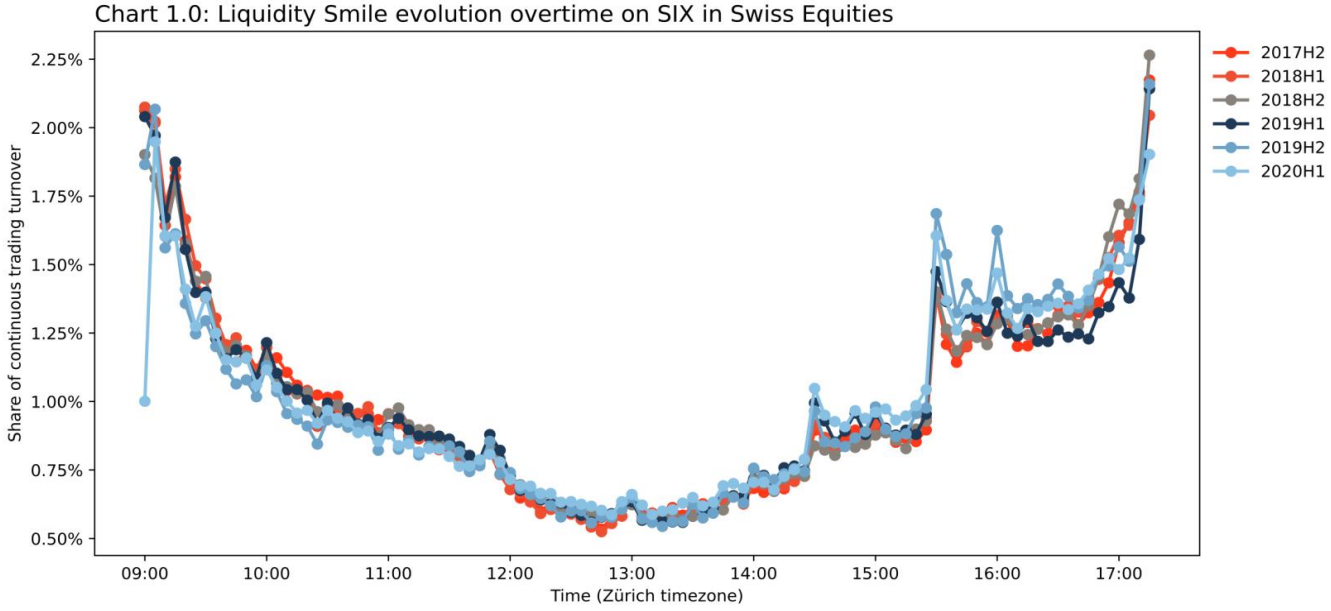
What's in a Liquidity Smile?

Whilst the average intraday liquidity profile or "liquidity smile" is a well understood indicator for volume and time weighted trading strategies it is also an extremely useful lens through which market structure can be explored.

Analysing more than CHF 4 trillion worth of turnover traded, we explore what the average intraday liquidity profile for on-book continuous trading sessions (i.e. "liquidity smile) says about how intraday liquidity shifts over time, trading models and regular & irregular intraday liquidity events.

Chart 1.0 summarises how the average intraday liquidity profile on the Swiss Stock Exchange in Swiss Equities has evolved over time including periods of equivalence and non-equivalence. The shape of this profile demonstrates clearly what is commonly referred to as a liquidity smile. Typically this highlights: (i) a decline in volumes from the open; (ii) a trough around midday before (iii); a slight pick-up in activity after lunch;(iv) a mid afternoon step change in volumes due to the US Market Open1 and (v)a peak in activity prior to the local closing auction. The shape of the curve is as commonly expected, however when analysing its shape over subsequent year halves we can see a couple of interesting points. Firstly, there is a slight tilting of the curve from H2 2019 onwards, where the share of volume traded in the morning decreases and the share of the volume traded in the afternoon increases. This tilting coincides with both the introduction of non-equivalence and a general increase in volumes traded in closing auctions across Europe since July 2019. Secondly, for H1 2020 we see the liquidity smile in the first 5 minutes of continuous trading being significantly lower than other periods, this is due to delayed openings across H1 2020 caused by exceptionally market high volatility.

Chart 1.0: Liquidity Smile evolution overtime on SIX in Swiss Equities



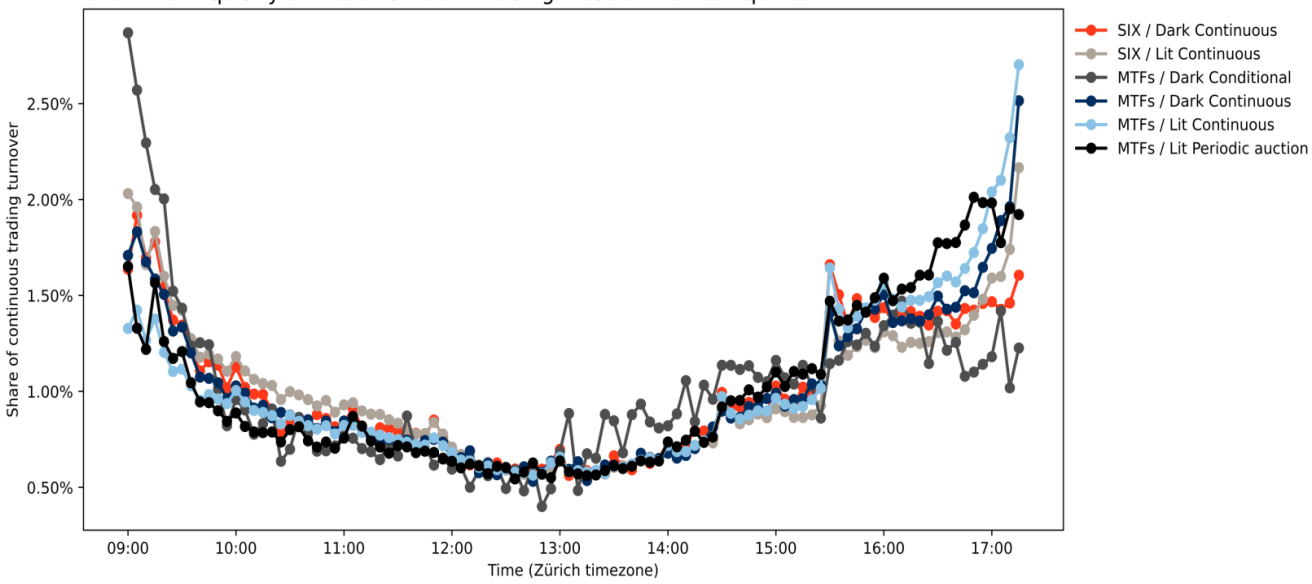
Data sources: BMLL, SIX | Securities: Swiss equities | Venues: SIX | Venue types: Lit, dark (excluding primary auctions)
Sample period: Jul 2017 - Apr 2020 | Sampling frequency: 5 minutes

Chart 2.0 offers us another example of the usefulness of liquidity smiles for examining market structure. This chart compares the liquidity smiles of the different trading models utilised to trade Swiss Equities continuously between January 2018 and June 2019. Some interesting points to note on this chart are: (i) trading activity on trading models of the Swiss Stock Exchange (the CLOB and SwissAtMid) appears to be higher in the morning and lower in the afternoon relative to trading on MTF models which are lower in the morning and higher in the afternoon; (ii) the liquidity smile for dark conditional venues is lopsided to the left with a peak of activity in the morning, higher activity from 1pm and a significantly lower response to the US Market Open relative to the other trading models

[1] N.B. We can see evidence of a double step which is reflective of a shift in time difference between ZH and NY but more on this on Chart 3.0

and (iii) the liquidity smiles for MTF lit continuous and periodic auction models are both similar in shape and the most lopsided to the right, with trading activity lower in the morning and higher in the afternoon (particularly after the US Market Open). The tendency for trading activity to be higher on MTF trading models in the afternoon (with the exception of conditional venues) tallies with the view that intraday market share for MTF's across Europe is usually highest toward the end of the trading day.

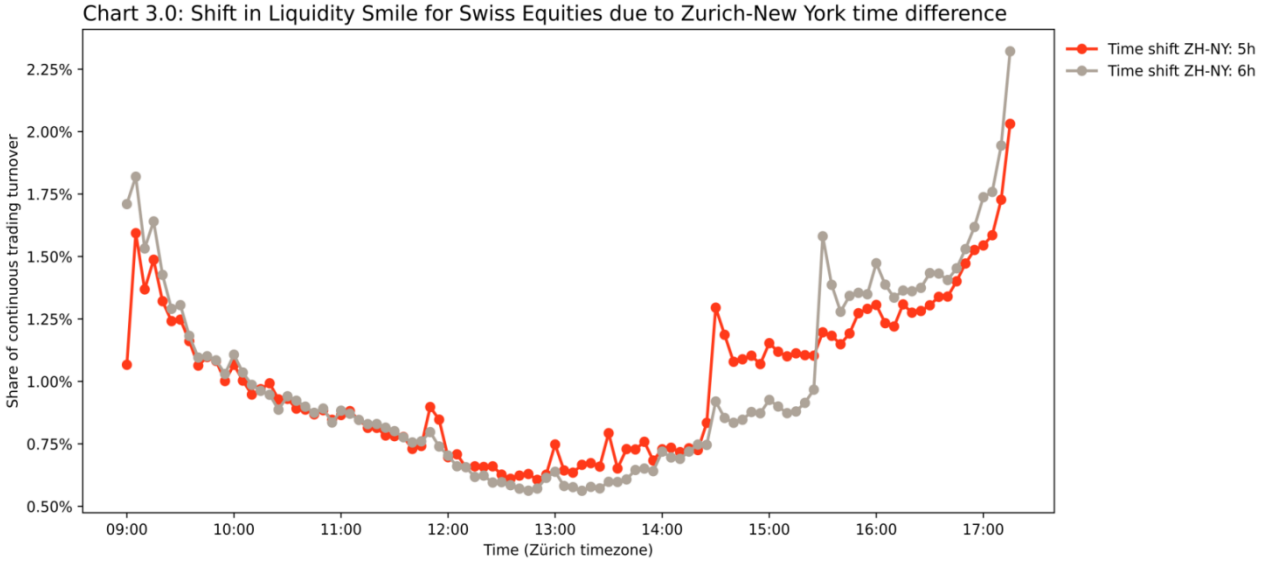
Chart 2.0: Liquidity Smiles of different trading models in Swiss Equities



Data sources: BMLL, SIX | Securities: Swiss equities | Venues: SIX, Aquis, Cboe, Turquoise | Venue types: Lit, dark (excluding primary auctions)
Sample period: Jul 2017 - Jun 2019 | Sampling frequency: 5 minutes

Charts 3.0 and 4.0 offer us a view of the usefulness of liquidity smiles for analysing temporal market structure events that have a liquidity impact – namely a change impacting the hours of operation of important interconnected markets. Chart 3.0 illustrates the impact on the liquidity smile of the time difference between the Swiss Cash Equities Market (Zurich) and the US Cash Equities Market (New York), with a greater time difference (i.e. 6 hours) leading to less overlap in trading between the two markets and a condensing of overlap-trading into a shorter time window. This causes the liquidity smile to become steeper with higher trading activity toward the beginning and end of the trading day and slightly lower trading activity in the middle of the day.

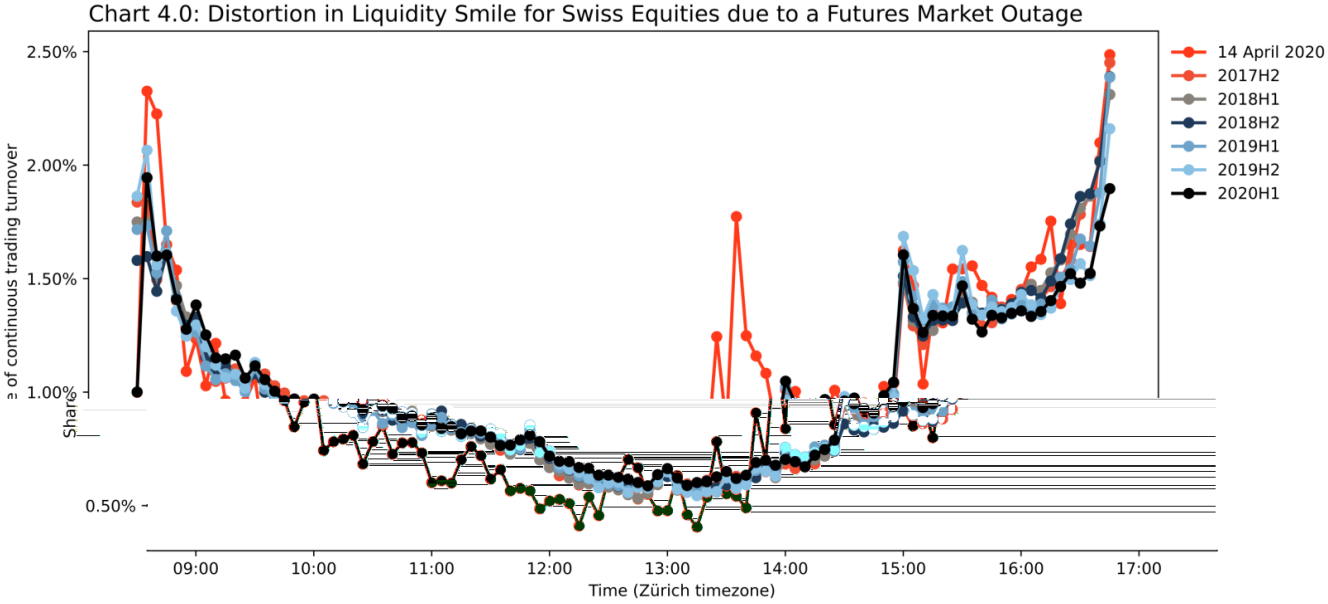
Chart 3.0: Shift in Liquidity Smile for Swiss Equities due to Zurich-New York time difference



Data sources: BMLL, SIX | Securities: Swiss equities | Venues: SIX, Aquis, Cboe, Turquoise | Venue types: Lit, dark (excluding primary auctions)
Sample period: Jul 2017 - Apr 2020 | Sampling frequency: 5 minutes

Furthermore, Chart 4.0 illustrates the significant distortion caused to the liquidity smile for Swiss Equities due to an outage in the Futures Market (Eurex) on the 14th of April – a topic we'll be happy to explore in one of our next Trading InfoSnacks.

Chart 4.0: Distortion in Liquidity Smile for Swiss Equities due to a Futures Market Outage



Data sources: BMLL, SIX | Securities: Swiss equities | Venues: SIX, Aquis, Cboe, Turquoise | Venue types: Lit, dark (excluding primary auctions)
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It is clear from the above charts that the shape of a liquidity smile is impacted by different temporal factors, trading modalities and technical or regulatory shifts – something that makes it a unique tool for analysing market structure.

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